



Science @HKU

港理

ISSUE
24

FACULTY OF SCIENCE NEWSLETTER



HKU SCIENCE
Oak Anniversary
明德於櫟 格物以理

Recall the Past, Reconnect for the Future

– Moving forward to

HKU Science Oak Anniversary 2019

Achieve

excellence (past, present and future)

Connect

bringing our alumni, faculty and students together

Educate

enhancing our role in the community

Highlights

- Alumni Stories and Sharing
- Major Breakthrough in Knowledge of Dinosaur Appearance and the Discovery of a New Bird-like Dinosaur with Flight Associated Feathers
- Discovery of Rice Straw as a Raw Material for Biofuel Production



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Dear readers, *The Way It Is* by William Stafford

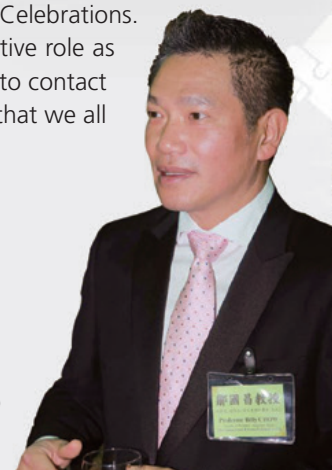
*There's a thread you follow.
It goes among things that change. But it doesn't change.
People wonder about what you are pursuing.
You have to explain about the thread.
But it is hard for others to see.
While you hold it you can't get lost.
Tragedies happen; people get hurt or die; and you suffer and get old.
Nothing you do can stop time's unfolding.
You don't ever let go of the thread.*

Some people believe that a soulmate relationship is formed when the gods tie a red thread around the ankles of two people. Through this invisible thread, they are bound for life. If we look at this world holistically, this concept is not too far fetched nor is it only limited to two people at a time. I like to believe that we are connected through collective memories and shared experiences that transcends and grows through time. Allowing us to have a special bond with people that we might not know in our daily lives but never the less shares something very important and unique with. In this case, I am talking about the shared beginnings at HKU Faculty of Science.

As we begin to prepare for the upcoming celebrations of the 80th Oak Anniversary, I want to take this opportunity to make a heartfelt call to all alumni worldwide to find that shared thread and connect with us again and celebrate what we have built together. 80 years is a long time to learn, share and grow. Our early groups of graduates had to face the dark times of war and occupation. But they prevailed and the graduates after them continue with the same steadfastness to become people we are proud to be connected with. In the past decades, our alumni have contributed to the growth and prosperity of Hong Kong. For the Oak Anniversary Celebrations, we plan to share 80 stories from our alumni. I urge you to tell us your stories, your thread with the people, the faculty and the society. In this issue, which is dedicated to our alumni, two of our most distinguished alumni Dr Patrick Poon (1970 BSc graduate) and Dr Winnie Tang (1999 PhD graduate) will tell us their stories, and I look forward to reading them. Dr Data Ng (2015 PhD graduate) and Mr Danny So (2010 BSc graduate) will share regarding their participation in the Challenge Cup. We will also publish selected alumni sharing from our Online Alumni Corner as well as a message from the HKUSAA. Finally, we would like to call for alumni helpers for our Oak Anniversary Celebrations. Your participation, be it being class representatives, or playing a more active role as sub-committee members, is clearly essential to us. Please do not hesitate to contact us if you are interested in threading and linking us to build a community that we all belong to.

Yours sincerely,

Professor Billy K C Chow
Chief Editor & Associate Dean (Development and External Relations: Local)
Professor, Chair of Endocrinology, School of Biological Sciences, HKU



Winning Motto for the Faculty of Science 80th Anniversary

The Best Motto Contest for HKU Science 80th Anniversary, the prelude to our anniversary celebrations in 2019, was concluded in the end of September. We are pleased to announce that both the "Most Popular Motto" and "Winning Motto" for the Best Motto Contest for HKU Faculty of Science 80th Anniversary go to our Physics alumnus **Mr T C Wong** (class of 1986).

Mr Wong's winning motto **"Science Founds Sapientia; Oak Sprouts Virtus"**
(明德於櫟；格物以理)

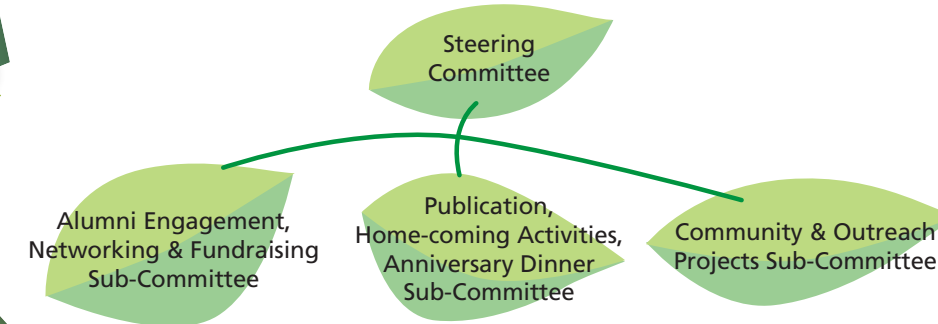
endows meaning to our oak anniversary, linking the long established motto of the University "Sapientia et Virtus" and the unfailing quest for knowledge of generations of alumni in HKU Science Family. Talking about his inspiration on the motto, Mr Wong said, "The spirit of our University motto always lingers. There, I learnt symmetry. My work is to translate into English, with faithful parity, two simple Chinese verbs connecting 'Oak', 'Science' and 'HKU'."

Recall the Past, Reconnect for the Future

The Faculty of Science is embarking on the preparatory work of our anniversary celebrations in 2019. We hope to achieve much from our celebration activities, while their success relies tremendously on the continuous support and participation of our alumni. Let's connect and get prepared for our Oak Anniversary (the 80th Anniversary of HKU Faculty of Science) in 2019!

Organising Committees for the Faculty 80th Anniversary

In celebration of our Oak Anniversary, a series of events have been tentatively planned ahead, and *three working groups* have been established under the Steering Committee:



Alumni Helpers Wanted for Oak Anniversary Celebrations

The planning of anniversary celebrations is now in full steam. We sincerely hope that our alumni can join us in this networking effort so as to foster our connection with generations of alumni again. We also invite our alumni to serve as our class representatives and help spread news of our events to the fellow classmates from time to time.

Interested parties please contact the Faculty Office at scialum@hku.hk for more information.

Events Highlight

A series of events will be organised to celebrate our Oak Anniversary; they include but not limited to:

- Talks of distinguished alumni
- Theme-based public lectures
- STEM workshops/competition for secondary schools
- Visits to science-related institutes
- Eco-tours / field trips
- Home-coming day
- Anniversary dinner

Best Motto Contest

We are impressed by the creativity of Mr Wong and are most honoured to have this winning entry as our official motto throughout our anniversary celebrations. Having consulted some botanists in the university, we have also replaced the old oak logo with one of native species. We hope that this new logo with strong rooted oak will better represent HKU Science and our alumni.

May we offer our congratulations to Mr Wong, and once again, thanks for your support to the contest.



HKU SCIENCE
Oak Anniversary
明德於櫟 格物以理

FUN FACTS
Do you know about **HKU Science**

1. How many departments were there in the Faculty of Science in 1939?
2. When was the Science Society established?
3. When was the first postgraduate student admitted in HKU Science?
4. When was the Hong Kong University Science Alumni Association (HKUSAA) founded?
5. How many schools/ departments are there in the Faculty of Science now?

See the answers at the last page.

Dr Patrick Sun-Cheong Poon

1970 BSc graduate

Chairman of Harvest SCP Group Company Limited

About Dr Patrick Poon

- 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 University of Hong Kong Foundation for Educational Development & Research
- Chairman of The University of Hong Kong Convocation Standing Committee
- Chairman of Advisory Committee, Lap-Chee College
- Chairman of Shing Cheong Charitable Foundation Limited
- Independent Non-Executive Director of Hang Seng Insurance Co. Ltd.
- Court Member of Hong Kong Polytechnic University
- Chairman of Hong Kong Polytechnic University Foundation
- Member of the Board of Governors of Hang Seng Management College
- Chairman of Foundation Management Committee of Hang Seng Management College
- Charter President of Rotary Club of Hong Kong Harbour
- President of The Association of Zhong Shan Siulamese in Hong Kong

"I was admitted into the HKU Faculty of Science in 1967 as an undergraduate for Physical Science. I studied Physics, Chemistry and Mathematics in my first year and selected Chemistry and Mathematics for my second and third year studies. I took Statistics as one of my Mathematical subjects and never thought that it was the basis of my lifelong career as I was passionate with Chemistry at that time of my life.

In my HKU days, like today, our professors and teachers were all dedicated to help us to succeed in our studies and future careers. Even staff in our residential halls and administrative departments treated us as family members. I must say that I was transformed after my three years in HKU from a mere student to an open-minded adult with plenty of confidence to go into Society.

Besides the knowledge and wisdom I gained from my three years in HKU, the network of teachers and alumni helped me greatly in my whole life. This network is very powerful, not only in Hong Kong, but in many parts of the world. As an English speaking University, HKU graduates easily communicate internationally and many opportunities can be presented to us as a result.

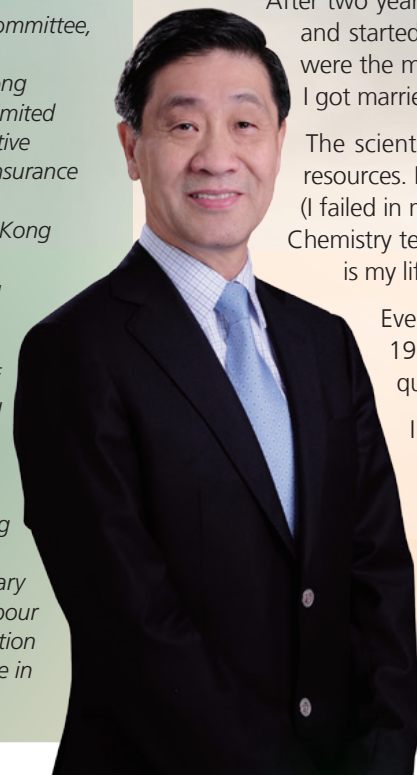
After two years working in Hong Kong government, I got a place in an insurance company and started from the bottom as an actuarial trainee. I consider the ensuring three years were the most memorable years of my life. I focused on my daily work and night studies. I got married but had time with my wife on Sundays only.

The scientific methods I learned at HKU helped me to manage my time and limited resources. I failed in my first actuarial professional examination but my experience at HKU (I failed in my first Mathematics Test in HKU first year too) helped me to recover. My HKU Chemistry teacher, Professor C K Poon, gave me a lot of encouragements at that time. He is my lifelong mentor.

Eventually I was qualified as an Actuary, Fellow of the Institute of Actuaries in 1975 and started my career in the insurance industry with a solid professional qualification behind me. And I retired after 40 years in the insurance industry.

I am always thankful to HKU. So I was very happy when I had the opportunity to start giving support to my alma mater. Starting from donations to scholarships, research and student accommodation, I also became members of various HKU working and governance committees, in Council, Court and Foundation.

My new role as the Chairman of the HKU Convocation gave me the opportunity to work with the over 180,000 HKU alumni worldwide. Although I took this role exactly 50 years after my entry to the HKU Faculty of Science, it is never too late to make more contributions to The University."



What our Distinguished Alumni "Say"

Dr Winnie Shuk-Ming Tang

1999 PhD graduate

Founder and Chairman of Esri China (Hong Kong) Limited

"I am glad to share with you that my latest book *Surfing the IT World* obtained the publishing award (Commerce and Management Category) in the Hong Kong Publishing Biennial Awards 2017*.

This is the first publishing award I have received and I truly believe it belongs to my alma mater as I was given a chance to study Geographic Information System (GIS) at HKU, teach GIS after my graduation in HKU and start my own GIS business in my home town.

Over the years, I believe that GIS can assist the organisations and individuals in decision making and improving productivity, it helps to analyse and organise multi-level spatial data and make it convenient to manage a smart city as well. To make GIS beneficial to the society, I started my own business 20 years ago. At that time, I determined to establish a market which would become a self-sustaining environment for those students studying GIS to apply their knowledge to the community. By doing so, I could bring together innovative people and technology and creative thinking. This would also help to develop a new economy and market, and thus enhance Hong Kong's competitiveness.

With the continuous efforts of my team, my company can get over the tectonic shifts in technology throughout the years and being recognised by the Information and Communications Technology (ICT) industry in the region. This publishing award is just the best gift to celebrate my company's 20th Anniversary!

Actually, studying at HKU is the most memorable days in my life. I was so proud to be part of it and I was excited to be invited to teach a master's course on smart city this year too.

I sincerely hope the alumni and the current students can embrace the technology and work hand in hand together to build a smart city for Hong Kong."

* To know more about the Hong Kong Publishing Biennial Awards 2017, please visit <http://www.hkpba.org/>



About Dr Winnie Tang

- Honorary Professor, Department of Computer Science, HKU
- Founder and Honorary President of Smart City Consortium
- Founder and Chairman of the Conservation E3 Foundation
- Member of Antiquities Advisory Board
- Co-Founder and Board Member of eHealth Consortium
- Director of Asia eHealth Information Network (AeHIN)
- Advisor of Our Hong Kong Foundation
- Member of Computer Science Advisory Committee, Department of Computer Science, HKU
- Advisory Member of The Hong Kong Society for Rehabilitation

View Dr Tang's e-book at:

Chinese version

<http://www.winnietang.hk/ebook/SurfingtheITWorld/>



English version

<http://winnietang.hk/ebook/SurfingtheITWorldEnglish/mobile/index.html>



Ms Kelly Ngan 2004 BSc graduate (Mathematics)

"During my study at HKU Mathematics, I was able to choose one of three study streams and I picked my favourite subjects, Mathematics, Economics and Finance. I built up all round knowledge at HKU and my university life was very fruitful with actively participating in a variety of extra-curricular activities at my residential hall, department and university. I made many good friends and it is my honour to be an alumna at HKU Science.

Based on my strong finance and mathematics training at HKU, my first job was landed on a large bank as an analyst in the risk management department. I am now a Director of one of the PRC Investment banks. I have also been involving in youth development at my spare time; I have been one of the committee members in Sha Tin District Youth Programme Committee since 2015. I would like to devote more in community service so as to have the best balance of work and life."

from Our Alumni

"Hear"



Ms Lucarius Riddle Von

2016 MSc graduate (Applied Geosciences)

"Hope these field trip photos can draw more people's interest in Geology and know that there are actually many geological heritage sites in Hong Kong."



Professor Lui Lam 1965 BSc graduate

As the founder of the International Liquid Crystal Society and a researcher formerly worked in the Institute of Physics, Chinese Academy of Sciences, Professor Lui Lam has given a talk on "Tsinghua University's Liquid Crystal Research in the 1970s and 1980s" at Tsinghua University recently. He will also give a talk on "Bettering Humanity: The Scimat Approach" in the 6th International Science Matters Conference which he co-chairs in Cascais, Portugal (see website: www.scimat-2015.com).

View Professor Lam's profile and research interest at:

www.sjsu.edu/people/lui.lam/scimat



Call for Sharing

We welcome your articles, photos, stories and updates. There is no limitation on the format for sharing. For digital photos, it would be good to be 1MB or above and with captions. Please send your sharing in no more than 100 words with your name, university number, discipline of study and class of graduation to scialum@hku.hk by email.

Join Forces to Win in the Challenge Cup Championship

On their debut in the 'Challenge Cup' National Competition Hong Kong Regional Final – Hong Kong University Student Innovation and Entrepreneurship Competition 2017, our two young alumni Dr Data Ng and Mr Danny So displayed innovative mind and talents, winning both the Grand Award and First Place Award for their innovation project named '42Lab – A portable hardware platform of biotech experiments in STEM education' under the 'Entrepreneurship' category. Their project is in line with the recent promotion of STEM education in Hong Kong, which is a key emphasis in lifelong learning and whole-person development.

Dr Ng also received the Third Place Award for his individual project named 'Project Raphael'. Let's hear about their reflections on joining this inter-university competition journey!



Mr Danny So

"During the pursuit of knowledge in biological and biomedical sciences, I always want to make contributions to the betterment of human well-being through academic research, but I have never realised that there were other opportunities which could also make a change – that is to empower our younger generations through better science education.

"What makes our Faculty great is not only about education, but also the strong bonding among the alumni and current students. Being an alumnus of the HKU Science family is always my privilege and honour."

With the invitation from Dr Data Ng, who also aspires to promote biotechnology in the community, we joined forces to design a portable hardware platform for biotechnology experiments. The suitcase-sized all-in-one modular system provides functions equivalent to conventional laboratory equipment that are too expensive and bulky, solving practical issues faced by secondary schools. We believe that having this "laboratory toolbox" we can, together with the implementation of STEM education in Hong Kong, bring tremendous benefit to students. Our idea has been vitalised with the support from the HKU DreamCatcher 100K funding. It has also paved way for the later recognition received in the Challenge Cup which further augmented our determination to strive towards our goals."

- 2010 - BSc graduate (Major in Biology; Minors in Biochemistry and Biotechnology), HKU
- 2013 - MPhil in Neurology, HKU
- 2016 - HKU winning team in the HKU 100K Entrepreneur Seed Fund Competition
- 2017 - PhD candidate in School of Biomedical Sciences, HKU



Dr Data Ng

"My concentration for both BSc and PhD studies fell on Physics. It is hard to believe that someone like me could make a project related to biotechnology. I truly think that biology is the future; nonetheless, the current development of biology is just like the computation/ electronics 50 years ago. The potential of biotechnology is huge and widely affecting in different industries; AI/deep learning from neuroscience is one of the examples.

As a result, I acquired the knowledge of biotechnology from scratch by myself. It was tough and the equipment was not easily available for an amateur biologist like me. The learning progress inspired me to create an

easier and better biotechnology learning experience for the youth. Luckily, this vision is recognised by the judges of Challenge Cup and I won in this inter-university competition finally. I am also very glad that this is the first time that HKU team was awarded the Overall Champion in this competition."

- 2009 - BSc graduate (Major in Physics and Finance; Minor in Astronomy), HKU HKU Core Group (Connector)
- 2014 - HKU Core Group (Connector)
- 2015 - PhD in Physics, HKU HKU Convocation Standing Committee Member
- 2016 - HKU Court Member HKU winning team in the HKU 100K Entrepreneur Seed Fund Competition



Portable Hardware Platform of Biotech Experiments

Power supply to supply power to the whole toolbox

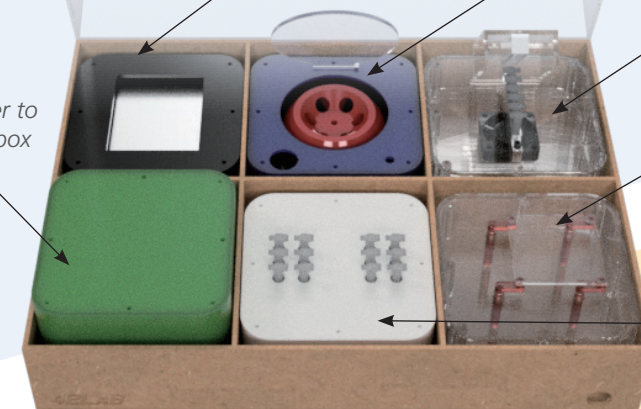
Blue light transilluminator to visualise DNA products that have been separated by gel electrophoresis

Microcentrifuge to separate substances in solution

PCR Machine to amplify DNA fragments

Orbital shaker for the effective mixing and blending of substances

Temperature bath to allow solutions to reach a certain temperature for different experimental purposes



What's New about HKUSAA

HKUSAA Executive Committee, 2017-18

- President **John Yu Chun Lee** 2006 BSc graduate (Animal & Plant Biotechnology)
- Vice President **Sik Chuen Chok** 1990 BSc graduate (Mathematics & Physics)
- Secretary **Ting Ting Ngan** 2004 BSc graduate (Mathematics)
- Treasurer **Luk Pan Ng** 1997 BSc graduate (Mathematics)
- Executive Member (in alphabetical order) **Caroline Pui Sze Chan** 1996 BSc graduate (Animal & Plant Biotechnology)
- Yau Fu Chan** 2012 MSc graduate (Food Safety & Toxicology)
- Kam Pui Law** 1977 BSc graduate (Mathematics & Physics)
- Kin Hung Ngan** 1995 BSc graduate (Environmental Science)

What's New about HKUSAA



Dear fellow alumni,

This is John Lee, the new President of the Hong Kong University Science Alumni Association (HKUSAA), 2017-2018. I am glad to share with you about the news and updates of HKUSAA.

HKUSAA was founded in 1989 when the Faculty of Science celebrated its Golden Jubilee, with the mission to foster fellowship among science graduates, provide support to undergraduates and contribute to the society in the scientific, commercial and industrial fields.

Over the past years, HKUSAA has been actively engaging our fellow alumni through science-focused educational tours and festive celebrations. Hosting regular gatherings with current science students has been a rewarding experience in understanding how we can better assist their transition towards graduation.

Another initiative of HKUSAA is to mobilise fellow alumni to support the Faculty of Science's upcoming Oak Anniversary in 2019. As you may be aware, our Faculty has recently extended an invitation to all HKU science alumni to become our class representatives as well as to join our working group(s) for the anniversary celebrations.

Please reach us by email at hkusciencealumni@gmail.com if you and your peers are interested in joining us. You are highly recommended to stay tuned on our official Facebook Page for the latest science trends and HKUSAA activities.

Yours sincerely,
John Lee
President
HKU Science Alumni Association



Go Global

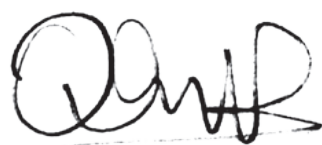
– Move the Frontiers Forward

by Professor Quentin A Parker, Associate Dean (Global)

I am the new Associate Dean (Global) and my major intent is to firmly establish the HKU Faculty of Science as internationally diverse in outlook, reach and impact.

I arrived at HKU in early 2015 after a 30-year astrophysics career in the UK, Australia and France. After a period as the Head of Department of Physics, I was offered an associate Deanship in the global area that is of a great interest to me and I relish this chance. This portfolio, which includes Mainland China, will help re-align our Science Faculty's focus. I share HKU's vision to be Asia's Global University while our Faculty aims to be "pre-eminent in Hong Kong, leading in Asia and highly competitive globally across research, teaching and knowledge exchange". We aim for excellence in everything we do and aspire to leadership in many areas. We also need to pro-actively grasp and exploit the tremendous opportunities that linking and partnering with other elite international universities, institutes and enterprises offers. Attracting the very best global talent, whether undergraduate or postgraduate students, postdoctoral fellows or staff, is a strategic aim. My role is to help us accomplish these aims.

The world appears at a crossroads with great challenges such as our degrading environment, growing global population and delivering better lives for all through sustainable development. For me education and having an informed, scientifically literate population is key. This can help develop mutual understanding of transnational issues where science can provide solutions. Hong Kong is a global hub and gateway while HKU is a world player in tertiary education. Taken together I believe we can have an important role in breaking down barriers and building trust between East and West through shared endeavour in scientific research, education, partnership and exchange. Together we can help to address these important issues. So let's get to it!



Professor Quentin A Parker
Associate Dean (Global)



About Professor Quentin A Parker

Professor Quentin A Parker (BSc Hons 1982; PhD 1986 St. Andrews University) joined HKU in March 2015. He was previously the joint Anglo-Australian Observatory (AAO)/ Macquarie lecturer in astronomy (2002-2015) and director of the research centre for Astronomy, Astrophysics and Astrophotonics (2010-2015). Professor Parker worked at the Royal Observatory Edinburgh (1986-1992, 1999-2002) and the AAO (1992-1999). He helped develop the FLAIR-II and 6DF multi-object fibre-spectroscopy systems at the UK Schmidt Telescope (UKST) and supported the 2dF and AAOmega multi-object fibre spectroscopy systems on the 3.9m Anglo-Australian Telescope.

Professor Parker was also the P.I. for the highly productive UKST H-alpha narrow-band wide-field survey of the Southern Milky way. He has supervised a significant number of PhD, MSc and honours students to completion and is keen to attract students. Professor Parker currently heads the 'HASH' (Hong Kong/AAO/Strasbourg H-alpha) planetary nebula database team. He also has a life-long interest in antiquities and a strong interest in Chinese Bronze artifacts. He has won many national and international prizes and awards for teaching, supervision, research and science leadership over a 30-year career.

Research Areas

Professor Parker's research activities are recorded in over 247 refereed publications among 523 bibliographic entries of all kinds that have more than 12,550 citations. These outputs are mainly but not exclusively associated with Wide Field Astronomy. This research includes large-scale redshift surveys, low-surface brightness galaxies, so called "Galactic archaeology" projects such as "RAVE" (the RAdial Velocity Experiment), supernova remnants, Planetary Nebulae and other phases of late stage stellar evolution where significant contributions have been made. Professor Parker has also helped develop fibre-optic astronomical instrumentation. His more recent interests are in science pedagogy and interdisciplinary research and education that combine arts with science, such as with his major new UGC T&L grant.



Further Reading

Professor Quentin A Parker has recently shared his views about the importance of science education. He stated that "this education must progress appropriately from kindergarten to university and from formal education to on-going life-long learning, free of religious, business or political influence as far as is possible.". The article is available at <http://www.scifac.hku.hk/news/comm/profparkerart>.



4 light years

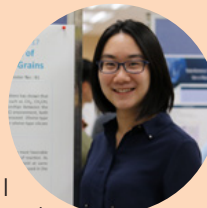
Credit ESA/Hubble & NASA, ESO, Ivan Bojicic,
David Fred & Quentin Parker

Go beyond Classroom – Diverse Learning Experience @ HKU Science

Apart from having lectures at the HKU campus, our students are offered many opportunities to have various learning experience to broaden their horizons. Let's hear what they experienced @ HKU Science.

Wei Dai

2017 BSc graduate (major in Chemistry; minor in French)



"My final year project related to catalytic conversion of methanol to polyatomic molecules over olivine surface consisted of both experimental and computational study. I received plenty of guidance and tutoring from my supervisor and the PhD student in our group, which helped me perform the experiments smoothly. The computational part appeared very difficult at the beginning because it was a brand new area to me. Fortunately, by seeking advice from experienced fellows, consulting academic papers, and trying out by myself, I eventually obtained some meaningful results! Apart from the knowledge in textbooks, the more important thing is that I learnt how to tackle a specific problem in the scientific way!"



Michelle W M Yeung

BSc student (double major in Environmental Science and Geography)

"The 2-week summer course at the University of British Columbia (UBC) gave us a great opportunity to experience outside Hong Kong; not only the eye-opening fieldwork, but also the splendid nature in Vancouver. We truly enjoyed our days at UBC although it is short."



Angie Chan Wu

BSc student (double major in Environmental Science and Geography)

"There were a lot of firsts in my exchange study at the University of Toronto; for example, it was my first time living in a dorm to experience freedom and independence. Secondly, I was surprised by the proactivity of my classmates and witty professors which made a great impact on my learning attitude. Lastly, I was able to experience a "melting pot" with the diversity of cultures in Toronto. I fell in love with this city and hope to go back someday."



Winston K T Lau

BSc student (major in Food & Nutritional Science; minor in Ecology & Biodiversity)

"The summer study at UBC provided me an inspirational opportunity to explore my future path. I understood food ingredients and production in a marine science perspective through the course, which also stimulated me to have an intention to have a research on salmon. My stay at UBC was so amazing and I have experienced a lot which I could not touch in Hong Kong!"



Hamsun H S Chan

2017 BSc graduate (major in Environmental Science; minor in Geography)

"Visiting South Africa is surely one of the most unforgettable experience in my life. We have the privilege to go camping under the unpolluted night sky, listen to the waves crashing on the shore, and enjoy the walks of Tsitsikamma – one of the most spectacular marine national parks in South Africa. This trip also allows me to explore and appreciate the rocky shore from a scientist's perspective. The most special thing in this trip is the interaction with other local students, by chatting with them, and sharing our languages, we all have learnt a lot about the local culture."

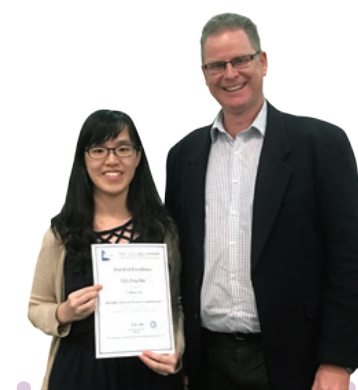


Achievements

Mr Brian M Y Chan, MPhil candidate at the Department of Physics under the supervision of Dr Jeremy J L Lim, received the **Champion and Online People's Choice Award** at the HKU Three Minute Thesis (3MT®) Competition 2017 with his presentation title 'Peering Through Space and Time with Nature's Cosmic Telescope'.

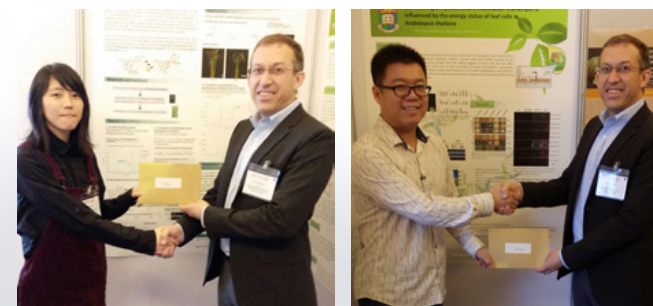


Mr Ting Yu Chan, MPhil candidate at the Department of Earth Sciences, was awarded the **2017 Graduate Student Fellowship** organised by the Society of Economic Geologists Foundation, Inc.



Miss Charlotte W M Lee, BSc student at the Department of Earth Sciences under the supervision of Dr Zhonghui Liu, was awarded the **first runner-up** in the AGS (HK) Final Year Projects Competition 2017 organised by the Association of Geotechnical & Geoenvironmental Specialists (Hong Kong) with her project title 'Late Holocene Sea Surface Temperatures in South-Eastern Waters of Hong Kong'.

Mr Baohu Dai, Mr Jizhuang Wang (right), Mr Ze Xiong (left) and Mr Jing Zheng (middle), PhD candidates at the Department of Chemistry, received the **First Place Award** under the Innovation – Energy and Chemical Engineering Category in the 'Challenge Cup' National Competition Hong Kong Regional Final – Hong Kong University Student Innovation and Entrepreneurship Competition 2017.



Miss Lydia P Y Lam and Mr Yuzhe Sun, PhD candidates at the School of Biological Sciences, won the prizes designated for student posters with their individual projects 'Characterisation of tricin biosynthetic pathway in rice' and 'RNA editing of cytochrome c maturation transcripts is influenced by the energy status of leaf cells in Arabidopsis thaliana' respectively at the 4th Plant Genomics and Gene Editing Asia Congress 2017 held in Hong Kong in April 2017.



Mr Renjie Lu and Mr Jia You, PhD candidates at the Department of Statistics and Actuarial Science, and Mr Brian M Y Chan, MPhil candidate at the Department of Physics, received the **second runner-up** with another teammate, Mr Haofeng Li from the Department of Computer Science, in the Hang Seng Bank FinTech Hackathon competition.

From left to right:
Mr Brian M Y Chan, Mr Jia You,
Mr Renjie Lu, Mr Haofeng Li



New Staff

Dr Andrés Benchimol Lecturer, Department of Statistics and Actuarial Science

Teaching areas: actuarial statistics for life, non-life insurance business

"After studying actuarial science at the University of Buenos Aires, I worked as an actuary in various insurance companies, until I decided to devote myself to my profession but from a different perspective – education. I got my PhD working at the Department of Statistics of Carlos III University of Madrid so I can work in what I find most rewarding, which is teaching in a university environment."



Dr David Lee Assistant Professor, Department of Statistics and Actuarial Science

Research interests: extreme value theory, high-dimensional dependence structures, multivariate tail dependence

"My research concerns the statistical treatment of simultaneous occurrence of extreme or rare events, such as floods and stock market crashes. As the consequences of such events can be devastating, we need a proper assessment of the chances of extreme events using statistical models for risk management purposes. Besides research, I look forward to transferring my knowledge on quantifying uncertainty to students, so that they are better equipped with practical tools to handle the current world overwhelmed with data."



Major Breakthrough in Knowledge of Dinosaur Appearance and the Discovery of a New Bird-like Dinosaur with Flight Associated Feathers

by Dr Michael Pittman, Department of Earth Sciences

Birds – or avialans – are the only dinosaurs that survived the end Cretaceous extinction. They are theropods, a hugely diverse clade of two-legged dinosaurs that include *T. rex*, and are represented by 10,000+ living species. The early evolution of birds and flight are iconic events in the history of life. Recent studies of early birds and their closest relatives – or paravians – have uncovered phenomenal insights into their genealogy, biology, ecology and long-term evolutionary patterns, and indicated that anatomies and behaviours traditionally associated with birds were actually acquired much earlier by non-avian theropods. This includes small body size, 'modern' feathers, complex feather colouration, flapping-based locomotion and powered flight capabilities. Persistent challenges and uncertainties in paravian genealogy as well as missing anatomical data make it difficult to fully understand the evolution of these anatomies and behaviours. In the Faculty we have been trying to address these shortcomings by producing more accurate genealogies, finding new species and developing state-of-the-art techniques to reveal the finer details of paravian evolutionary history.

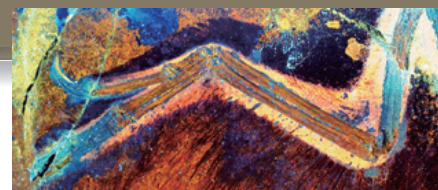
Recently, we have been using high-powered lasers to directly reveal the true appearance of fossil paravians by uncovering soft tissues preserved alongside their bones. These are preserved as impurities in the minerals making up the fossils that the laser light interacts with, which can give off light that we see as fluorescence. As well as documenting discrepancies with the appearance we expect from comparisons between fossil skeletons and closely-related living animals (modern birds and crocodiles), we have been able to describe anatomies

that we would otherwise have been unable to accurately predict. In one of the earliest paravians *Anchiornis* we even saw the shape and skin texture of the wings providing crucial anatomical information from a time when we think birds first evolved. For more information, please visit <https://www.nature.com/articles/ncomms14576>.

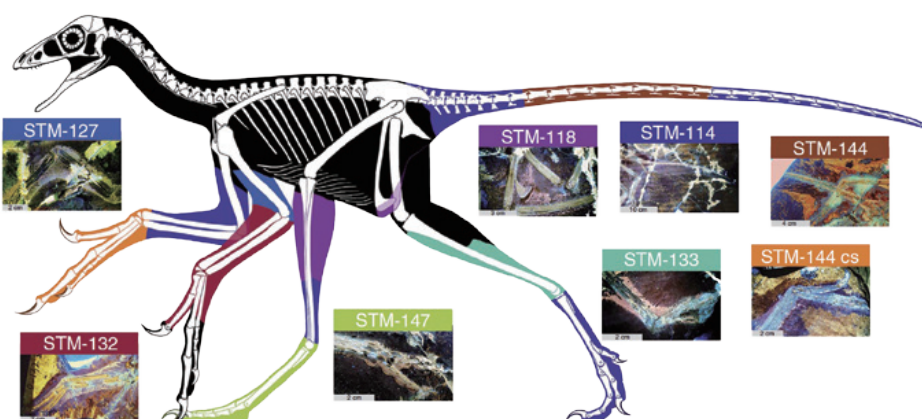


(a) Photo; (b) line drawing of an asymmetrical tail feather from Jianianhualong (Photo courtesy: Xu, Currie, Pittman et al. 2017)

We have also been successful in finding important new paravian species. Recently, we described the first troodontid with asymmetrical feathers – *Jianianhualong tengi*. Troodontids are one of the three paravian clades (the others being Avialae and Dromaeosauridae [Velociraptor is a dromaeosaur]) and the flight-associated feather type we found looks like an aeroplane wing in cross-section. Currently, these feathers are known from one dromaeosaurid and most avialans, but the feathers of our new taxon are only discernible on the tail and they are not asymmetrical enough to have been stable aerodynamic structures. This nevertheless raises crucial questions about the early function of asymmetrical feathers and whether flight evolved more than once. Please visit: <https://www.nature.com/articles/ncomms14972> for further information.



The wing of the early paravian *Anchiornis* as revealed by Laser-Stimulated Fluorescence (LSF) imaging (Photo courtesy: Wang, Pittman et al. 2017)



A high-detail quantitative body outline of *Anchiornis* produced by LSF imaging (Photo courtesy: Wang, Pittman et al. 2017)



Jianianhualong tengi, the first asymmetrically feathered troodontid (Photo courtesy: HKU/Julius T. Csotonyi 2017)

More about dinosaur research & our free online course

If you are interested in working with or supporting Dr Pittman's dinosaur research, please get in touch with him at mpittman@hku.hk.

You can learn more about dinosaurs from HKU's free online course *Dinosaur Ecosystems* at <https://www.edx.org/course/dinosaur-ecosystems-kong-long-de-sheng-hkux-dinox>.

Discovery of Rice Straw as a Raw Material for Biofuel Production

by Dr Clive S C Lo, School of Biological Sciences

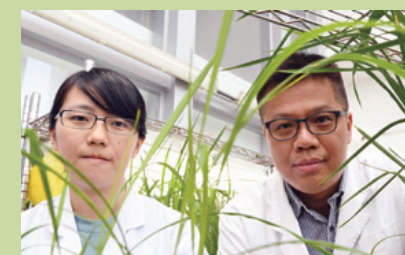


Figure 1: Cellulose in rice straw can be used for bioethanol production. However, the presence of lignin impedes the release of fermentable sugar from cellulose.

Straw is commonly used for feeding animals, burning and baling, but it can also be used as a raw material to produce biofuel. Ethanol is a clean and renewable biofuel traditionally produced by fermentation of sucrose from sugarcane or glucose released from corn starch. With an increasing demand on biofuel in recent years, cellulose from non-edible plant materials has been used as raw materials for bioethanol production (Figure 1). Since cellulose is crosslinked with lignin in plant cell walls, it is very difficult to release glucose from cellulose. Lignin is a complex polymer which functions to provide mechanical strength and structural integrity in plants. Nevertheless, expensive and complicated procedures are required to loosen the lignin barrier in order to utilise cellulose more efficiently during the production of bioethanol.

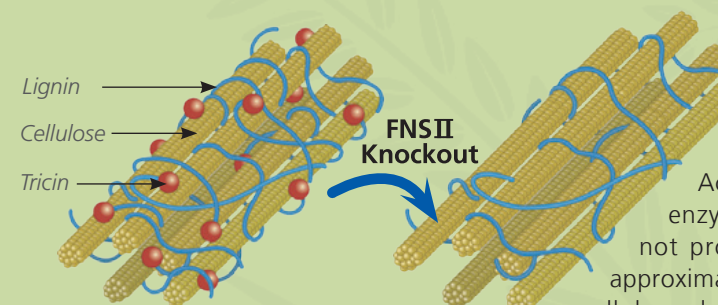


Figure 2: Control (Left) and Experimental (Right). After flavone synthase II (FNSII) is knocked out, rice straw does not produce tricin and its lignin content is reduced by approximately one-third. The glucose yield is increased by 37% after cellulose degradation.

Rice and other cereals belong to the grass family. Lignin in their stems and leaves contains a special component called tricin. HKU plant biochemists Dr Clive S C Lo and his student Dr Lydia Lam, together with Kyoto U lignin specialist Dr Yuki Tobimatsu, started a collaborative project two years ago. According to their discovery, when flavone synthase II (FNSII), a key enzyme involved in tricin synthesis, is knocked out, not only is tricin not produced, but the lignin content in rice straw is also reduced by approximately one-third (Figures 2-3). In addition, the yield of glucose from cellulose degradation is increased by 37% without any chemical treatment

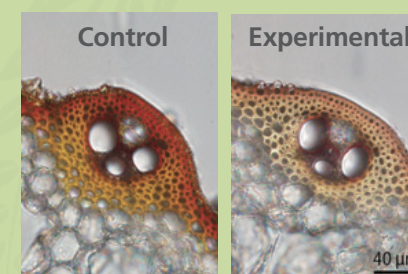


Figure 3: The images show the cross sections of rice stems. After knocking out FNSII (Experimental), lignin content (stained area) is substantially reduced compared to control.

(Figure 4). Glucose released from cellulose can be used for bioethanol production. In other words, it is more efficient to produce ethanol from this kind of rice straw: the cost of lignin treatment can be reduced and the production of ethanol can be enhanced. Importantly, there are no negative impacts on rice growth and productivity. As plants in the grass family all contain tricin-bound lignin, this strategy can be applied to other cereals like maize, wheat, and barley as well as grass species (e.g. sorghum and switchgrass) cultivated around the world exclusively for ethanol production, so that their biomass can be utilised more efficiently as raw materials for biofuel.

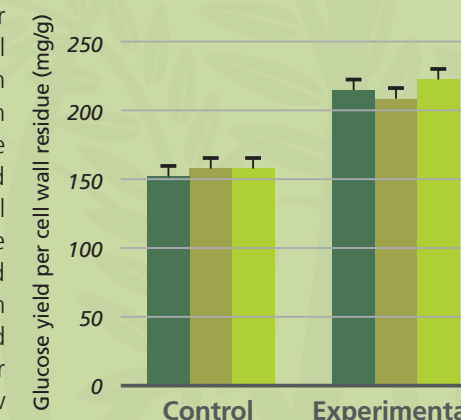


Figure 4: Glucose yield from FNSII-Knockout (Experimental) rice straw is increased by up to 37% (without chemical treatment), making it more efficient for ethanol production. Data is collected from 3 plants for each group.

For more information, please visit the video clip at <https://uvision.hku.hk/playvideo.php?mid=20956>

Dr Lo's research breakthroughs in tricin biosynthesis and improvement of biomass digestibility were published in a notable plant science journal *Plant Physiology* (165:1315, 168:1527 and 174:972-985).



From left to right: Professor Guochun Zhao, President and Vice-Chancellor Professor Peter Mathieson, Professor Kenneth M Y Leung, Dr Xiang Li

Internal Awards

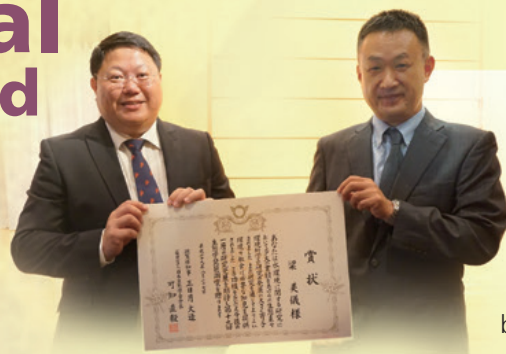
Three Science academic staff members were presented in the Award Presentation Ceremony for Excellence in Teaching, Research & Knowledge Exchange 2016 of HKU for their remarkable performances. They were:

Professor Kenneth M Y Leung, School of Biological Sciences, for the **Outstanding Young Researcher Student Supervisor Award 2015-16**;

Dr Xiang Li, Department of Chemistry, for the **Outstanding Young Researcher Award 2015-16**; and

Professor Guochun Zhao, Department of Earth Sciences, for the **Outstanding Researcher Award 2015-16**.

External Award



Professor Kenneth M Y Leung (left), School of Biological Sciences, was awarded the **19th Biwako Prize for Ecology** jointly by the Government of Shiga Prefecture and the Ecological Society of Japan for his academically and socially significant achievements in the field of aquatic ecology in Asia. Professor Leung demonstrated a great potential to become a central figure in ecology.

Faculty Ranking



HKU Science Ranks High in QS World University Rankings by Subject 2017

According to the *Quacquarelli Symonds (QS) World University Rankings by Subject 2017*, HKU Science ranks high among the world's top universities. Our achievements are summarised as follows:

By **Disciplines** **21st** **Natural Science**



By **Subjects**

51st — 100th



Materials Science

Biological Sciences

27th **Earth and Marine Sciences**



Mathematics

Chemistry



Environmental Sciences



Physics and Astronomy

20th **Statistics and Operational Research**



The Faculty has built up a strong reputation for excellence in science education and research, and has developed itself into a world-class science school. This good news brings immense encouragement to HKU Science and drives us to continue to strive for the highest qualities in education and research.

HKU-TCL Joint Laboratory for New Printable OLED Materials and Technology

HKU and TCL Corporation Ltd. (TCL), which is one of the three largest partners of the Hong Kong Science Park to date, have established a strategic partnership and held an opening ceremony of the "HKU-TCL Joint Laboratory for New Printable OLED Materials and Technology" on August 2, 2017. President and Vice-Chancellor Professor Peter Mathieson of HKU and Chief Executive Officer Mr Dongsheng Li of TCL officiated at the ceremony.

The HKU-TCL Joint Laboratory for New Printable OLED Materials and Technology is to combine HKU's strength in applying technological innovation and TCL's leadership in

the industry with an objective to foster the collaborative effort in developing the high performance solution-processable gold(III) complexes that are capable of serving as phosphorescent dopants in the fabrication of OLEDs and to explore their possibilities for preparing printable inks for commercialisation.

Professor Vivian W W Yam, Director and Chief Scientist of the HKU-TCL Joint Laboratory and Philip Wong Wilson Wong Professor in Chemistry and Energy, is delighted to partner with TCL in advancing translational research. "The establishment of this HKU-TCL Joint Laboratory is timely. It will not only provide a technology platform for facilitating the collaboration with industries in the Mainland and the Guangdong Province region, for motivating midstream to downstream R&D and commercialisation activities, but also in pushing basic research excellence towards translational research activities in an area of high global topical interests that leverage the unique and outstanding strengths in HKU," she said.



Opening Ceremony for HKU-TCL Joint Laboratory for New Printable OLED Materials and Technology

HKU-TCL新型印刷OLED材料與技術聯合實驗室揭幕禮

2 August 2017
2017年8月2日



President and Vice-Chancellor Professor Peter Mathieson (left) remarked that the Joint Laboratory would be a successful one with promising achievements to become a world-leading center in the area of new OLED materials and technology.

Strengthening Knowledge Exchange and Technology Transfer between Hong Kong and Sichuan Province

With the aim to strengthen the knowledge exchange and technology transfer between Hong Kong and industry in Sichuan Province, a three-party collaboration involving HKU, the government of Meishan city of Sichuan Province and Sichuan Knowledge Express Institute for Innovative Technologies (a local material development and innovative technology company) has been set up. The agreement signing ceremony, under the witness of Dr Li Yin, Governor of Sichuan Province, and Professor Peter Mathieson, our President and Vice-Chancellor, was held on August 22, 2017 at HKU.

Under the agreed framework, Professor Chi Ming Che, Department of Chemistry and Zhou Guangzhao Professorship in Natural Sciences, will be commissioned as the technology development consultant

of Meishan city as well as the chief scientific advisor of an innovative technology institute to be established in Meishan for a five-year term. Professor Che will be providing consultancy service on the development of novel materials of OLED emitters and molecular medicine. The government of Meishan city will donate HK\$3,000,000 per annum, totaling HK\$15,000,000 over five years, to support Prof Che's research activities in functional molecular material development and the related research funding applications. The government of Sichuan Province looks forward to establishing a close tie with HKU in other interdisciplinary and translational research areas following this strategic collaboration.



Upper row (from left to right): Ms Lifei Cai (CEO, Sichuan Knowledge Express Institute for Innovative Technologies), President and Vice-Chancellor Professor Peter Mathieson, Dr Li Yin (Governor of Sichuan Province), Professor Chi Ming Che

Lower row (from left to right): Vice-President and Pro-Vice-Chancellor (Research) Professor Andy Tzi Sum Hor, Mr Xinhai Mu (Secretary, Meishan Municipal Committee)

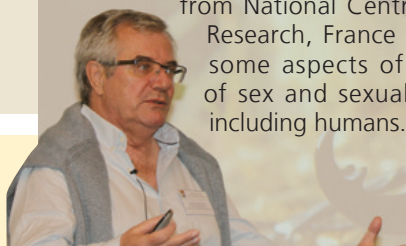
2017

March/
April

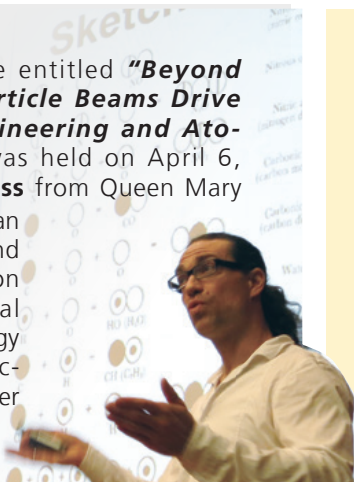
A series of Science talks was delivered by **Professor Albert Zijlstra**, Hung Hing-Ying Distinguished Visiting Professor in Science and Technology at the Department of Physics and Laboratory for Space Research, at HKU, local secondary schools and societies in March and April, 2017 to foster knowledge exchange in astrophysics.

April
5

A public lecture entitled **"The Rules of Sex"** was held on April 5, 2017, at which **Professor Olivier Kah** from National Centre for Scientific Research, France shared with us some aspects of the evolution of sex and sexuality in animals, including humans.

April
6

A public lecture entitled **"Beyond Nano-Tech: Particle Beams Drive Molecular Engineering and Ato-Technology"** was held on April 6, 2017. **Dr Gregory A Chass** from Queen Mary University of London gave an overview of the background and application of neutron science in tackling global problems in materials, energy and health at the atomic-level, and the exciting career opportunities arising.

April
18

A guest lecture of SCNC1111 Scientific method and reasoning was held on April 18, 2017, at which our Mathematics alumnus, **Mr Jasper Yok-sing Tsang, GBM, JP**, shared with students how he tackled the problems in daily life by means of different equations and probabilistic approach.

May
16

An information talk on the **6901 Bachelor of Science Programme** and an Information Session on **Young Scientist Scheme (YSS) – Pathway to Research** were held on May 16, 2017 to provide more information to prospective students about the undergraduate study at the Faculty of Science, HKU and the prestigious scheme offered for outstanding students. Laboratory and campus tours and break-out sessions of different majors were also arranged on that day.

August
22

An **alumni briefing session** was held on August 22, 2017 to give an overview of the tentative plan and directions of Oak Anniversary celebrations to Science alumni by Professor Billy K C Chow, Associate Dean (Development and External Relations: Local). It was a great evening with a lot of happiness and productive sharing.

FUN
FACTS

Answers of Fun Facts
about HKU Science

1. 4
2. 1940
3. 1950
4. 1989
5. 6

Acknowledgement

We would like to express our gratitude to our donors for their support in Year 2017.

- Mr Paddy Choy
- Professor Hans U Gerber
- Dr Boyd, Bo Guan
- Mr Chiu Ying Lam
- Mr Sai Wah Li
- Professor Wai Keung Li
- Dr Catherine Chunling Liu
- Mr Wing Lung Ngai
- Mr Gangxiang Peng
- Dr Patrick S C Poon
- The Indian Chamber 60th Anniversary Education Trust of The Indian Chamber of Commerce
- Ms Bonnie Tin
- Mr Andrew Wong / Sun Hung Kai Properties Insurance Ltd.
- Dr Philip L H Yu
(in alphabetical order)

