Be Inspired by Our PhD Students: Building a Research Career at HKU Science

What does the life of a PhD student look like? Some might regard it an extension of undergraduate studies. In this feature story, you will find that pursuing a PhD degree is way more challenging, yet much more fruitful than you can imagine. It is all about learning independently, questioning the boundaries of existing knowledge, embracing failure and pushing frontiers through collaborations.

With the support in different aspects, our recipients of HKU Presidential PhD Scholarship (HKU-PS) and the Hong Kong PhD Fellowship Scheme (HKPFS) gradually build their research career at the Faculty, marching closer towards their scientific goals day after day. Let us hear their experiences and get some inspirations here.

DEPARTMENT OF CHEMISTRY

Great Teachers Lead the Way

TEO Qin Han
Recipient of HKPFS and HKU-PS

A child, I was often fascinated by the reaction and interaction between chemicals, so I operated a tiny laboratory to do my silly experiments at home, which kindled my passion and interest in the realm of chemistry. I am a firm believer in chemistry and think that its proper applications via technology in various fields such as medicine, agriculture, and food industry shall be the legacy we leave to our future generations. Being able to be a part of this process gives me a great sense of achievement and pride.

My research focuses on making molecules with ‘seven-membered rings’, one of the many kinds of bioactive natural structures that chemists have always been fascinated with and hope to synthesise them to serve as a lead compound for drug discovery and advance our understanding of the natural world. It is one of the many paths I am attempting to explore. In the long run, I hope my work will contribute back to society and help shape the world into a better place.

Nevertheless, research funding is always a challenge. Apart from financial aid provided by my scholarship, I am grateful that I also received extra funding to support my research, and the level of support is sufficient for buying items related to my thesis research, procurement of research materials, books, equipment, publication fees, and editing service.

The transition from undergraduate study to postgraduate research is also one of the bottlenecks. The most important fixed goal you can set during your undergraduate study is the date for your graduation. But as a postgraduate, your experimental plan could be changed anytime if the current one does not work. I manage to overcome it with the help of my supervisor and lab mates. I am grateful for the opportunity to work with my current supervisor, Professor Pauline CHIU, who always makes sure that I am on the right track and actively gives me feedback during our weekly meetings, which helps plan subsequent experiments and works. And thanks to my lab mates, who are from diverse backgrounds, eager to share different experiences with me all the time. I also do my reflections and rethinking from time to time, which is an important process to lead myself and facilitate a more profound way of learning.

Tips to ace the scholarship interview

• Be authentic and be clear about your own direction.
• Don’t be nervous when you meet the panels! Just imagine that you are having a casual talk with them.
Networking Opens New Doors

YAP Inn Ming

Recipient of HKPFS and HKU-PS

Year 2 PhD student from Department of Physics
Field of study: nuclear physics, focusing on neutron isotopes that are important in stellar processes
Place of origin: Malaysia
Supervisor: Dr Jenny LEE, nuclear physicist

I have always been curious about the fundamental workings of things around us. During my undergraduate study, I had a particular interest in the building blocks of our universe and especially found nuclear processes intriguing. I was also aware that a research career would allow me to explore the frontiers of the scientific domain, which led me to look for opportunities in nuclear physics to further my studies.

In the summer of 2019, I met my current supervisor, Dr Jenny LEE, in an undergraduate conference at HKU and eventually started my PhD career at HKU. Science. Dr Lee has provided me with a lot of guidance and resources. Her sound knowledge and expertise in research in nuclear physics are immensely helpful in guiding me through the research process in this domain. Dr Lee’s ties within the international nuclear physics community have allowed me to collaborate with researchers worldwide. Her strong work ethic has also motivated me to stay in her footsteps to produce the best possible research work to my capabilities.

My research allows me to travel overseas since experimental research in nuclear physics requires extensive use of accelerators, which are only built in several places around the world. Since November 2021, I have been pursuing my research in the Institute of Physical and Chemical Research (RIKEN), Japan, one of the best facilities in the world for nuclear physics. The Radioactive Isotope Beam Factory (RIBF) at RIKEN has the most powerful accelerator for radioactive isotope production. Its capability allows me to study exotic nuclei that are both difficult to produce and elusive from measurements due to their short half lives.

My current research is to perform mass measurement of exotic nuclei in the neutron-rich rare-earth region. I will also be working on the development of current state-of-the-art mass spectograph devices to improve their efficiency and precision. The outcomes of my research will shed light on the formation and abundance of neutron-rich elements during nucleosynthesis – the production of elements in the stars.

In the near future, I foresee myself continuing the path of research in nuclear physics, and perhaps even contribute to the successful development of fusion energy. This would require me to further my expertise in my current research and come out a niche for myself. On the other hand, contemporary research is becoming more collaborative and I look forward to participating in such collaborations.

The travelling allowances enabled me to attend more overseas conferences. Even amid the pandemic, I could still make it and make the most of it online and exchange ideas with my fellow researchers around the globe.

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I have always loved animals; I just did not know how to make it my lifetime career. Interested in biology, I thought that I wanted to become a veterinarian, but after joining university, I realised what I truly liked was actually called ‘ecology’. During the pursuit of my master’s degree in Paris, I started to be captivated by conservation physiology; an emerging field which offers a more dynamic approach in respect to climate change when compared to conventional conservation measures. The different research opportunities I had during that time played a big part in shaping my research direction and motivated me to do a PhD. I have always loved forensic science as portrayed in fiction or drama, but I had never connected it to a potential career in conservation, until early 2017 when I moved to Laos, regularly observing ostriches, monkeys, eagles, iguanas, or crocodile eggs in wildlife market – some of which are not even native species to Asia! I embarked on my PhD journey during the same year, keeping wildlife trade research in the back of my head. My research is nested into a broad field of wildlife conservation, focusing on conservation physiology. I investigate the physiological responses of diurnal and nocturnal ectotherms to climate change, with a particular interest in lizards. Besides, I have also developed a project about the trade of today’s goods, both for traditional medicine and pet trades. Being exposed to the Conservation Forensics Lab at the School of Biological Sciences, I developed interests and skills from many passionate ecologists, for whom I am very grateful. My supervisor, Dr Timothy BONEBRAKE, has played a crucial role in shaping the direction of my research and motivated me to do a PhD. He always welcomed my questions, advice I received from him over the years, even during the most stressful parts of my work. The different research opportunities I had during that time played a big part in shaping my research direction and motivated me to do a PhD. As a graduand in the Class of 2023, I am fully aware of the highly competitive job market in the academia. To cope with this, the ability to carry out interdisciplinary research projects is a major calling card. Therefore, I am currently designing research on both environmental elementary cycling (by running simulations) and microbial activity (by lab work), and I also equipped myself by learning versatile research techniques, including computer simulation and microbial culturing, hoping that enhancing interdisciplinary research skills may benefit my future research path.

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At this point, I have been trying my best to address small questions, as I believe this will eventually help the scientific community solve the big questions collectively.
Early Research Experiences Fuel Interest in Science

Elise Chit Yu IUI
Recipient of HKU-PS
Year 1 PhD student from School of Biological Sciences
Field of study: metabolic adaptation of the skeleton in adipose tissue
Place of origin: Hong Kong
Supervisor: Dr Chi Bun CHAN, an expert in energy metabolism, whose research interests lie in physiological regulation and pathological alteration.

Like many of my undergraduate fellows, I hardly knew what scientific research was like as a freshman, but I was deeply impressed by the enthusiasm of researchers and their commitment to lifelong learning, which led me to take the initiative and volunteer as a student helper in the laboratory led by Dr Minghao WANG, whose research focuses on anti-cancer effects of phytochemicals.

My first research experience was very educative. I learned to integrate various experimental techniques in chemical compound analysis, better understand the cell culture process, and was given a chance to perform animal experiments. Besides teaching me an array of techniques, Dr Wang also shared his research experience along the way, and showed me how to run a research laboratory, giving me an idea of what to expect in my scientific career.

After having a taste of scientific research, I was admitted to the Summer Research Fellowship (SRF) Scheme. I was given a chance to conduct an individual research project in Professor Nagano’s Prasad SHAH’s laboratory. Under his supervision, I discovered that using germinated wheat flour instead of regular one produced bread with significantly higher GABA content, unlatching the potential to make a hypertensive staple food.

Bringing up these experiences, I even extended my undergraduate study by enrolling in the final year research project (FYP), which trained me to be a logical thinker, thus preparing me for my independent postgraduate research.

Thanks to my current supervisor Dr Chi Bun CHAN, who was my teacher in an undergraduate course on endocrinology, he inspired me to explore the field of metabolism and motivated me to embark on the research journey. It has been seven months since I joined the PhD programme, and I fully enjoy the moment. Dr Chan’s research group creates a very comfortable and friendly atmosphere for newcomers, and I am instantly connected and developed a sense of belonging in the lab. Dr Chan is the kind of mentor who always initiates thought-provoking conversations that stimulate me to seek answers on my own rather than spoon-feed me information. Being around him is like having a supportive friend who always offers comfort and guidance to help me overcome adversity. Besides, I am still dazzled at the time by his logical intelligence!

My ultimate research goal is to unveil the interorgan crosstalk in fatty acid metabolism, which plays an important role in the progression of metabolic disorder, hepatopathy, and adiposity. With the help of collaborators in the chemical and clinical fields, my team could develop novel treatments for these currently intractable diseases and validate the results of the animal model in human clinical studies.

Get to the Bottom of Problems by Asking a Lot of Questions

Aneesh JATA
Recipient of HKU-PS
Year 1 PhD student from Department of Mathematics
Field of study: complex analysis
Place of origin: Hong Kong
Supervisor: Professor Tuen Wai NG, whose research areas are closely aligned with complex analysis, in particular, geometric function theory and invariant metrics, complex differential and functional equations, the geometry of polynomials, factorizations and iterations of meromorphic functions.

As a child, mathematics was like an anxiety-inducing chore to me. At some point in my early teens, I realized most of my phobias I had for the subject was actually attributed by my incomprehension of it. I did not understand why and what I was doing when facing homework problems. In this series, the dread was inevitable. Somehow, role modeling and the lack of understanding how mathematics formulae work prevented me from breaking them down to solve equations in the necessary way.

So I took it upon myself to probe on my shaky foundation in all I could. I could essentially ask ‘why’ repeatedly like a five-year-old child until I got to the bottom of it. Likely, after a very long time, and with the aid of the internet and some old textbooks, things began to click for me in a way I never thought was possible. Thanks to an excellent mentor, I had in high school, my peers and I were exposed to nontandard ways of approaching problems under his tutelage which inspired me to look beyond ‘school Mathematics’ and think about the possibility of pursuing doing Mathematics as my career.

Being encouraged by him, I enrolled on a university course opened to high school students. The style of thinking the course promoted was exciting. Although it had a huge learning curve and left me with more questions than answers, I was pretty much obsessed with trying to answer them from then on. This led me to continue learning Mathematics at university and eventually led me to the path of postgraduate study.

I have just completed my first year of PhD study, and the experience of working with my research group has been very rewarding and encouraging for so far. My supervisor Professor Tuen Wai NG has provided me with ample support both personally and professionally, and the questions being prompted by him and my group during presentations and discussion are invaluable to me, as they serve to point out errors in my thinking, as well as deepen my understanding of my studies. Most importantly, outside of academic matters, my family has been incredibly supportive of me.

I think it is too early to say about my future career pathway. Still, I am excited at the prospect of continuing to conduct research in mathematics and teaching the subject in some form, whether that be through staying in academia or otherwise.

“Do not be afraid to ask questions, even if they are elementary.”

Stipend and Support for the Most Talented Research Elites

HKU Presidential PhD Scholarship (HKU-PS)

As a part of the HKU Presidential PhD Scholar Programme, a prestigious scholarship package, namely, the HKU Presidential PhD Scholarship, is offered to attract top candidates from around the world to pursue full-time PhD studies at HKU. The HKU Presidential PhD Scholars will receive strong academic and training support from the University, e.g. individualized advisory service, training in teaching, chances to rotate among different research labs, disciplines, and more opportunities to interact with leading scholars. A group of distinguished faculty members will also give advice, provide additional mentorship and training opportunities, and oversee the academic career path.

Hong Kong PhD Fellowship Scheme (HKPFS)

Established in 2009 by the Research Grants Council (RGC), the Hong Kong PhD Fellowship Scheme (HKPFS) aims at attracting the best and brightest students in the world to pursue their PhD programmes in Hong Kong’s universities. Those who are seeking admission as new full-time PhD students in Hong Kong universities are invited to apply. Applicants should demonstrate outstanding qualities of academic performance, research ability, potential, communication and interpersonal skills, and leadership abilities.

In HKU, the package of recipients of HKPFS will be automatically upgraded to an HKU-PS one. A generous package for recipients of HKU-PS and HKPFS:

Cash award to support research & living expenses
HK$40,000 in Year 1; HK$20,000/year for the remaining normative study period

Conference & research-related travel allowance of HK$13,300/year

Postgraduate scholarship (PGS)
of HK$26,600/month

Waiver of tuition fees
for the whole normative study period (i.e. HK$42,100/year)

Guaranteed accommodation in Year 1
Hall place guaranteed in Year 1, with possibility of renewal in Year 2.

Additional support from HKU Science
The Faculty’s Doctoral Entrance Award of HK$15,000 in Year 1

For more details, please visit: https://bit.ly/3jAyw5S

Supervisor: Dr Chi Bun CHAN, an expert in energy metabolism, whose research interests lie in physiological regulation and pathological alteration.