Graduate School Award Presentation Ceremony 2021

The Graduate School held its annual Award Presentation Ceremony on December 15, 2021 to celebrate the achievements of our research postgraduate (RPg) students. A total of 193 RPg students from various disciplines were presented with awards.

The awardees included six recipients of the Li Ka Shing Prizes, ten recipients of the Award for Outstanding Research Postgraduate Student, and recipients of the HKU Presidential PhD Scholarship and University Postgraduate Fellowships.

The Ceremony was officiated by Professor Xiang Zhang, President and Vice-Chancellor; Professor Max Z. Shen, Vice-President and Pro-Vice-Chancellor (Research) and Dean of Graduate School; Professor Alice S.T. Wong, Associate Vice-President (Research); and Ms. Bernadette Tsui, Associate Vice-President (Development & Alumni Affairs) and Executive Director, HKU Foundation.

Our warmest congratulations to all the winners on your accomplishments!
List of winners of the Li Ka Shing Prizes 2019-20 and Award for Outstanding Research Postgraduate Student 2019-20:

**Li Ka Shing Prizes (2019-20)**

The Li Ka Shing Prizes are highly competitive and the recipients are the best of our elite students, having submitted the best theses in the Humanities and the Science Faculty groups respectively.

**Best MPhil thesis in the Faculties of Architecture, Arts, Business and Economics, Education, Law and Social Sciences**

Hui Fei CHAN (Department of Psychology)

**Best MPhil thesis in the Faculties of Dentistry, Engineering, Medicine and Science**

Pit Shan CHONG (School of Biomedical Sciences)

**Best PhD theses in the Faculties of Architecture, Arts, Business and Economics, Education, Law and Social Sciences**

Vesa Petri PURSIAINEN (Faculty of Business and Economics)

Tat Yeung James KUAN (Faculty of Education)

**Best PhD theses in the Faculties of Dentistry, Engineering, Medicine and Science**

Li LIU (Department of Mechanical Engineering)

Derek LEE (Department of Pathology)

**Award for Outstanding Research Postgraduate Student (2019-20)**

The Award for Outstanding Research Postgraduate Student gives due recognition to research postgraduate students who have submitted a thesis of exceptional quality and demonstrated outstanding performance in other academic aspects.

Mohammed Nadeem BIJLE (PhD, Faculty of Dentistry)

Chok Meng CHAN (MPhil, School of Chinese)

You CHE (PhD, Department of Civil Engineering)

Rui CHENG (PhD, Department of Mechanical Engineering)

Yiran HUANG (PhD, Department of Chemistry)

Anna Maria ISKRA (PhD, Hong Kong Institute for the Humanities and Social Sciences)

Xinran LI (PhD, School of Biomedical Sciences)

Andrew Thomas PARK (PhD, School of Modern Languages and Cultures (European Studies))

Zuochen WANG (PhD, Department of Chemistry)

Yu Yan YAU (MPhil, Department of Earth Sciences)
Striking Closer in the Search for Quantum Materials through Better Measurement of Quantum Entanglement

Quantum materials play a vital role in propelling human advancement. The search for more novel quantum materials with exceptional properties has been pressing among the science and technology community.

In the research of novel quantum states, e.g. superconductivity that is not affected by electronic resistance, experiments testing when and how atoms and subatomic particles of different substances interact with each other through entanglement in a quantum state are costly and difficult to execute. The investigation is further complicated when the classical LGW (Landau, Ginzburg, Wilson) framework fails to describe certain quantum phase transitions, namely deconfined quantum critical points (DQCP).

A research team from the Department of Physics – comprising PhD student Jiarui Zhao, Dr Zheng Yan, and Dr Zi Yang Meng – has developed a new and more efficient quantum algorithm of the Monte Carlo techniques adopted by scientists to measure the Renyi entanglement entropy of objects. With this new tool, they measured the Renyi entanglement entropy at the DQCP and found that the scaling behaviour of the entropy, i.e. how the entropy changes with the system sizes, differs greatly from the description of conventional LGW types of phase transitions.

This discovery, which has recently been published in Physical Review Letters, one of the most prestigious journals in physics, will lead to a more general characterisation of the critical behaviour of novel quantum materials, and is a move closer towards actualisation of the application of quantum materials.

(This article is adapted from https://www.hku.hk/press/news_detail_24042.html)

PhD Student Wins Third Place in Intellectual Property Law Essay Competition

Congratulations to Hongjiao Zhang - a PhD student in the Department of Law - for winning third place in the 2020 ATRIP Essay Competition for young researchers in intellectual property law. The annual competition is run by the Executive Committee of the International Association for the Advancement of Teaching and Research in Intellectual Property (ATRIP), and sponsored by the International Federation of Intellectual Property Attorneys. Hongjiao’s thesis research topic is about copyright law. Her essay, “A Typological Framework for the Implied License Doctrine in Copyright Law”, presents an integrative review of the implied license doctrine by setting out normative types of implied licenses. Key elements of the doctrine as derived from the existing cases are summarised to further define the framework as a flexible system with a greater degree of certainty. This typological framework is able to provide judges with guidance in construing the process of implication of copyright licenses, and as such, the judicial certainty and predictability will be improved.
PhD Student’s Start-ups Win Awards at Regional Youth Innovation and Entrepreneurship Competitions

Two start-up projects by PhD student Cobi Zhouming Xu have won awards at regional competitions on innovation and entrepreneurship. Cobi is a student in the Department of Mathematics and his research is on mathematical methods (deep learning, neural networks algorithms) for multi-omics and precision medicine. Drawing on his prior experience working in the financial industry, Cobi co-founded two start-up projects in distinct fields – fintech and precision medicine – under the supervision of his PhD supervisor Professor Michael Ng. The project teams have lined up AI talents from famous firms and top universities: Facebook, Morgan Stanley, Walmart Lab, the University of Cambridge, Harvard University, Hong Kong University of Science and Technology, and HKU.

The fintech project, “AI Phoenix”, is a high-performance collaborative modelling platform for financial data. The platform is dedicated to the development and application of advanced privacy computing, swarm learning technologies, and deep neural networks to solve problems such as the lack of dimensions of financial data in banks, data isolation in both intra- and inter-bank scenarios, the inefficiency of existing collaborative learning frameworks, and the high threshold for implementation. It helps banks to improve the efficiency of data analysis and utilisation of data resources while reducing the idle time of servers and the barrel effect, resulting in much more accurate user portraits and efficient user demand analysis. The project won Gold Prize at the 8th “Creation of Youth” China Youth Innovation and Entrepreneurship Competition (Internet section) and Second Prize at the 8th Innovation and Entrepreneurship Competition of University Students of Guangdong, Hong Kong, Macao, and Taiwan.

The project “AI Smart Medication System for Chronic Diseases” is about the application of AI in precision medicine. Inspired by Cobi’s volunteer experience in supporting medical teams in Beijing and Wuhan during the COVID-19 pandemic in 2020, the project is committed to providing cloud-based AI-empowered analytical solutions to enhance precision medicine. The system tries to offer technological remedies to the problem of medical data dispersion, and achieve high-accuracy analyses while preserving the highest standard of data privacy. The project won Second Prize at the 10th “Winning in Guangzhou” and Guangdong-Hong Kong-Macao Greater Bay Area Entrepreneurship Competition of College Students, and the start-up is now providing services to China’s top hospitals including Beijing Chao-yang Hospital, Wuhan Union Hospital, and Shenzhen People’s Hospital.
From Chillies to Chips

– An Alumni Story of Dr Ray Runyang Zhong

In the farmlands of Jiangxi province, mainland China, far from the giant townships of Beijing or Shanghai, the countryside awakens quietly. In the early morning sunshine, a very naughty boy creeps stealthily through a vegetable field looking for something tasty to snack on before school. He finds cucumbers and then chilli plants, but is soon spotted by an irate neighbour who marches him back to his parents. They are very upset indeed.

This scene is typical of the early childhood of Dr Ray Runyang Zhong, who confesses that, at that age, he had no interest in studying. He was more interested in playing games of ‘stones’ with his friends, fishing in the local river, or generally getting into mischief on the neighbouring farms.

Fortunately, a well-educated acquaintance of his father saw potential in the growing lad. Recognising that computers were the future, he suggested that Ray should take a college entrance exam to study computer science, technology, and mathematics. Young Ray passed, graduated from Gannan Normal University, and then became a teacher at a vocational institute.

Whilst studying for his master’s degree at Guangdong University of Technology, Ray entered industrial companies with a pioneering research topic in manufacturing execution systems of digital processing with microchips for advanced data transmission, such as today’s 5G. Through the different factories of various manufacturing companies, he gained invaluable insight into how the workforce – the frontline of industry – is supported by the underlying technology and IT systems. For half of his three years of study, he lived and worked alongside the factory workers, giving him practical knowledge of how a shop floor functions.

Based on the recommendation from Ray’s master’s supervisor, Professor Qingyun Dai, Professor George Q. Huang of HKU enlisted Ray as a research assistant. After proving his worth, Ray was recruited as a PhD student in to the research group.

Ray recognises Professor Huang as one of his significant mentors: “He helped me summarise all my practical experience, which greatly benefitted my research.” Acknowledging that he was a ‘headache’ for the professor for the first two years, as his English was so poor, and not wishing to let his mentor down, Ray rose early every morning to spend an hour reading English newspapers and magazines to improve his command of the language. “I’m fine with English now, but it was very hard – but no pain, no gain!”

With over 160 publications now under his belt, it’s not easy for Dr Zhong to single one out; however, he is very proud of his paper on “Big Data Analytics for Physical Internet-based Intelligent Manufacturing” published in the International Journal of Production Research, and awarded Best Paper of 2018. He also highlights his New Zealand Chinese Youth Scientist Award 2017 that he received when lecturing at the University of Auckland in New Zealand.

Today, Dr Zhong enjoys his job as an assistant professor in the Industrial and Manufacturing Systems Engineering department. As part of teaching new young researchers, he passes on the philosophies developed during his time at HKU. He emphasises how important it is to face challenges, turn them into motivation, and always share experiences with family and friends. “Get rid of problems quickly”, he says.

Dr Zhong is keen to move technology forward and is now closely involved in researching and finding solutions for smart prefabrication construction supply chain management. This will support the government initiative to construct new housing in Hong Kong. He is also collaborating with Jinan University for e-commerce cross-border logistics.

With this busy schedule, Dr Zhong has little time to look ahead, but says that “my aim for the future is always to be a good researcher and contribute to society”.

Dr Ray Zhong has travelled a long way: from chilli plants to microchips!
PhD Graduate Wins Award for Young Researchers in Ultrafast Optics

Congratulations to Bowen Li – a PhD graduate of the Department of Electrical and Electronic Engineering – who has been awarded the 2021 Bernard J. Couillaud Prize, which supports early-career researchers in the field of ultrafast photonics and its applications.

Bowen is currently a postdoctoral researcher at the University of Colorado, Boulder. His proposal focuses on the first counter-propagating all-normal dispersion (CANDi) fibre laser, which is an innovative dual-comb laser source that produces two frequency combs from a single fibre laser cavity.

The novel dual-comb design shows that bidirectional mode-locking in a fibre laser is possible using an artificial saturable absorber and all-normal dispersion. Compared with existing dual-comb fibre lasers, the CANDi fibre laser generates pulse energies with higher orders of magnitude and optical spectra that are completely overlapping and flat directly from the single cavity. It is expected that the CANDi fibre laser can be used in various applications, such as molecular spectroscopy, biochemical imaging, and precise laser ranging.

Tracking Tissue or Tumour Development Using Random Mutation in Cell Mitochondria

In humans, every cell is created by other cells through a series of cell divisions that can be traced back to a single fertilised egg. Discovering the lineage of each cell is the holy grail to address a range of biological questions such as how complex organs like the heart are formed, or how a single cancer cell develops into tumours. Traditionally, cell lineage tracing requires the introduction of external DNA material, called genetic reporters, into the embryo of an animal model so that a specific lineage can be identified. However, this intrusive approach is not feasible in humans. Recent bioinformatics MPhil graduate Aaron Kwok, from HKU’s School of Biomedical Sciences, developed an innovative strategy to use somatic mutations in mitochondrial DNA as natural internal genetic reporters. He developed a new bioinformatics program called MQuad to accurately harness these mutations to track the cell lineage of human tissues and tumours. This is a huge step in understanding the cellular origin and ultimately the treatment of cancer. The work was published in Nature Communications.

Aaron is currently a PhD student at the University of Melbourne.
March 7–11, 2022 marked the Graduate School Mental Wellness Week for research postgraduate students (RPgs) at HKU. During the week, five workshops were conducted by Dr Nimisha Vandan, our HKU alumnus, and Dr Amit Wanchoo, CEO of Space Communications and one of the 2018 HKU AsiaGlobal Fellows, both of whom are co-founders of OKAYMINDS. The workshops covered five essential aspects of mental wellness that are highly relevant to the study context of our RPgs: “Stress to strength”, “Attention please”, “You can do it”, “Power to empower”, and “Find a leader in you”.

The series started with the stress management workshop. Instead of getting worried, participating students were taught how stress can be converted into strength, which can subsequently be used to handle a situation constructively. The second workshop dealt with one of the most important assets for any student – the power of attention. By using this power effectively, students can see benefits in their personal and professional achievements. Participants were taught the skills for minimising random mind-wandering and procrastination, together with utilising time in the most appropriate way. The third workshop taught students various coping skills and methods for building mental resilience, also known as mental immunity, which can be used to face challenges and unpleasant events with little impact on physical and mental health.

The fourth workshop focussed on getting ready to overcome any inevitable rejections and/or failures in human life, especially considering research students’ vulnerability in the extremely competitive field of academic publication and funding. By cultivating a growth mindset, students can feel empowered to handle the rejections and failures. The fifth and final workshop was on finding a leader within oneself. As RPgs, recognising leadership skills and implementing them in day-to-day research work is of utmost importance. Once students are aware of the leadership skills, they will be able to exhibit these skills in their daily life and look beyond merely conducting research.

All of these skills support students in their learning process, helping them to learn how best to collaborate rather than compete with their lab mates or peers. Through interaction with the speakers, students started understanding and relating the purpose and meaning of their valuable research work with the problems in society. At the end of the workshops, students said they felt empowered and better equipped to contribute towards a bigger goal, i.e., to make this world a better place for everyone.

The two speakers – as researchers and experts in the field of mental health and wellness – educated, guided, and trained the participating students on various life challenges, and advised them on practical techniques to help deal with difficult situations. The RPgs showed great interest and involvement in sharing their views and experiences, and actively participated in various learning activities during the sessions, expressing that these workshops served as a unique platform to discuss their personal and research-related concerns and challenges.

The Graduate School would like to thank the two speakers for sharing their experiences and providing practical advice to help students develop a positive and productive mindset for personal and professional development.