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

DEAN
Professor Qiang ZHOU

Press release For immediate release

Eight young HKU scientists awarded
China's Excellent Young Scientists Fund 2023

September 13, 2023

Eight young researchers at the University of Hong Kong (HKU) have been awarded the Excellent Young Scientists Fund (Hong Kong and Macau) by the National Natural Science Foundation of China, under the Ministry of Science and Technology (MOST), for 2023.

For the fifth consecutive year, HKU has secured the highest number of projects among its peer institutions since the fund was extended to Hong Kong and Macau for applications by eight designated universities in 2019.

The Excellent Young Scientists Fund is an annual grant designed to support young male scientists under age 38 and young female scientists under age 40 who have achieved outstanding research accomplishments, allowing them to further pursue their chosen fields.

With only 25 projects funded across Hong Kong and Macau this year, the competition is highly selective. Each project will receive RMB2 million in funding for up to three years through cross-border remittance, directly supporting the researchers' work in Hong Kong or Macau.

The eight young HKU scientists:

Faculty of Science

Dr Chan Kei Yuen
Assistant Professor, Department of Mathematics

Dr Huang Zhongxing
Assistant Professor, Department of Chemistry
Dr Luo Xin
Research Assistant Professor, Department of Earth Sciences
Dr Wang Peng
Assistant Professor, School of Biological Sciences

Faculty of Engineering
Dr Peng Yifan Evan
Assistant Professor, Department of Electrical and Electronic Engineering
Dr Xiang Chao
Assistant Professor, Department of Electrical and Electronic Engineering
Dr Yang Yuxiang
Assistant Professor, Department of Computer Science

LKS Faculty of Medicine
Dr Yuan Shuofeng
Assistant Professor, Department of Microbiology

The award winning projects:

Dr Chan Kei Yuen
Assistant Professor, Department of Mathematics, Faculty of Science
Project Title: Representation Theory of Reductive Groups
Dr Chan investigates research representation theory of general linear groups over local fields, and obtained the following three important fundamental results in branching laws:
(1) Introduced Hecke algebra methods, solving a Ext-conjecture of Prasad;
(2) Resolved the indecomposabiliy for branching laws;
(3) Proved the local non-tempered Gan-Gross-Prasad conjecture for quotient branching laws.
Dr Chan would focus on studying the following two: (1) in p-adic case, the relation of branching law for L-functions for arbitrary irreducible representations, aiming to give some generalization on the classical generic case, and (2) in real case, developing the tool of Schur-Weyl type duality and Bernstein-Zelevinsky type filtration with an eye of applications to branching laws and related problems. The main idea comes from the theory for p-adic case developed by Dr Chan.

Dr Huang Zhongxing
Assistant Professor, Department of Chemistry, Faculty of Science
Project Title: Asymmetric Catalysis
For the past three years, Dr Huang's team has devised a new class of dinuclear zinc catalysts with a tetradentate ligand to enable the desymmetric hydrosilylation of mono- and disubstituted malonic esters. The asymmetric

reduction has allowed his team to access all-carbon quaternary stereocenters, tertiary alkyl halides, tertiary alcohols, and other functionalized motifs in a rapid, modular, and stereoselective fashion. Further examination of new catalysts and reaction paradigms will be carried out to investigate the asymmetric transformations of more dicarbonyl and active methylene compounds. These projects include the synthesis of chiral amino acids via asymmetric decarboxylation, desymmetric transformations of malononitrile, and construction of axial chirality and resolution methods using the dinuclear zinc catalysts.

Dr Luo Xin
Research Assistant Professor, Department of Earth Sciences, Faculty of Science
Project Title: Coastal hydrogeology
Dr Luo's past studies are centred in Submarine Groundwater Discharge (SGD) and its ecological significance in the following three areas: 1) The quantification of SGD, 2) Solute reactive transport tin the groundwater system, (3) Interaction between groundwater and surface water. In this project, Dr Luo intends to deal with three major scientific questions: 1) The characterization of the spatial temporal feature of SGD derived nutrient loadings; 2) How groundwater borne nutrient support the new production in the coastal waters; 3) exploration of the trigger mechanism of ted tide outbreak and establishment of localization model and early warning system of red tide outbreaks.

Dr Wang Peng
Assistant Professor, School of Biological Sciences, Faculty of Science
Project Title: Control of chloroplast protein homeostasis
Dr Wang intends to focus on the molecular mechanisms underlying the homeostasis of chlorophyll-binding proteins, including uncovering the regulatory mechanism orchestrating chloroplast protein translation and chlorophyll biosynthesis, dissecting the mechanism of coupling light-harvesting chlorophyll-binding protein transport and chlorophyll biosynthesis, illustrating how plants control the degradation of chlorophyll metabolic enzymes and light-harvesting chlorophyll-binding protein and exploring the feasibility plan of improving the photosynthetic efficiency of crops.

Dr Peng Yifan Evan
Assistant Professor, Department of Electrical and Electronic Engineering, Faculty of Engineering
Project Title: Computational Imaging and Mixed Representation
By incorporating advances in artificial intelligence and optics to bridge the long-standing gap of optimal designs between devices and algorithms, Dr. Peng's research enables physically compact, yet functionally powerful imaging and display solutions, with the potential impact of revolutionizing the camera and display industry. Dr Peng's proposed research aims to carry out more in-depth research in systematically establishing the software-hardware co-design mechanism in a wider range of intelligent visual sensory systems. In particular, Dr Peng strives to establish a robust design framework using a volume (stack) optics differentiable propagation model; and verify the mechanism of a compact AR holographic display system using an optimized optical combiner and a deep neural network-based hologram generation algorithm.

Dr Xiang Chao
Assistant Professor, Department of Electrical and Electronic Engineering, Faculty of Engineering
Project Title: Heterogeneously integrated optoelectronic devices
Dr Xiang focuses on the research of integrated photonic and optoelectronic devices on silicon. He developed multilayer heterogeneous integration techniques that enabled the single-chip integration of III-V and silicon materials with silicon nitride. Dr Xiang plans to continue the research of heterogeneous silicon nitride photonics and develop wavelength-tunable narrow-linewidth lasers, low-noise active microwave photonic devices, and low-repetition-rate electrically-pumped laser microcombs. At the same time, efforts will be put into the realization of integrating semiconductor optical amplifiers and photodetectors on the same platform. The applicant will optimize the device design and process flow to improve working device yield and study the interaction dynamics of laser and nonlinear microresonators. The research will enable the miniaturized optical systems on chip for high-speed optical communication, high-precision sensing, quantum information processing and so on.

Dr Yang Yuxiang
Assistant Professor, Department of Computer Science, Faculty of Engineering
Project Title: Quantum-enhanced metrology
Dr Yang focuses on quantum-enhanced metrology. Utilizing the techniques of optimal quantum metrology designed by Dr Yang, this project aims to address 3 key research questions in the emerging field of quantum metrology with indefinite causal orders: the ultimate precision limit of quantum metrology under indefinite causal orders, the optimal estimation scheme with indefinite causal structures, and estimation of quantum causal parameters. By solving these 3 questions, this project will strengthen the connection between quantum-enhanced metrology and the frontiers of physics, especially quantum gravity, and pave a new path for the theory and practice of parameter estimation in fundamental physics.

Dr Yuan Shuofeng
Assistant Professor, Department of Microbiology, LKS Faculty of Medicine
Project Title: Druggable antiviral targets
Dr Yuan's research focus on high throughput antiviral drug discovery and uncovering of novel druggable targets. He has made conceptual breakthrough that defines the roles of host lipogenic modulator SREBP and trafficking protein AP2M1 for broad-spectrum antiviral therapy. Dr Yuan will employ two strategies to systematically identify novel druggable sites for antiviral development: (1) to integrate the state-of-the-art fragment-based screening, chemical proteomics, and a surrogate 'mini-replicon' assay to explore druggable sites during RdRp-nsp7-nsp8 assembly and transcription/replication activities; and (2) to utilize CRISPR knockout screening and a fluorescent recombinant SARS-CoV-2 to identify novel host-dependent and -restriction factors for antiviral therapy.

For media enquiries, please contact Ms Casey To, External Relations Officer (tel: 39174948; email: caseyto@hku.hk / Ms Cindy Chan, Assistant Director of Communications of HKU Faculty of Science (tel: 3917 5286; email: cindycst@hku.hk).