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CityU secures HK$23m funding from two RGC Research Fellow Schemes

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(From left) RGC Senior Research Fellow Professor Yang Tong, and RGC Research Fellows Professor Johnny Ho, Dr Lu Yang and Dr Wang Feng.

City University of Hong Kong (CityU) has been granted more than HK$23 million in research funding from the inaugural Senior Research Fellow Scheme (SRFS) and Research Fellow Scheme (RFS) under the Research Grants Council (RGC).

The success in securing funding for development of four research projects is testimony to CityU's research strengths and recognition of the University's efforts in fostering interdisciplinary research.

The funding will be used to support four CityU scientists to advance research into mathematical theories for kinetic equations, flexible electronic technologies, nanomechanics and strain engineering, and novel light-generation technologies.

Professor Yang Tong, Chair Professor of Mathematics, was granted the title "RGC Senior Research Fellow". He will use the SRFS grant to develop analytic techniques that can be applied to studies on solution behaviour and fluid dynamic limits of some typical kinetic models, including the Vlasov-Maxwell-Boltzmann system and the Vlasov-Nordstrom-Fokker-Planck system, as well as other systems of kinetic equations. The findings of the project are expected to greatly enrich existing mathematical theories in those areas.

Professor Johnny Chung-yin Ho, Professor in the Department of Materials Science and Engineering, was conferred an "RGC Research Fellow". The research project he leads will address the growing need for advanced applications of flexible electronic technologies.

Through developing mechanically flexible negative-capacitance nanowire transistor arrays and integrated circuits, the project aims to establish design guidelines and versatile and cost-effective platforms to develop large-scale, high-performance, ultralow-power devices.

Dr Lu Yang, awardee of the RFS and Associate Professor in the Department of Mechanical Engineering, will investigate the mechanics and deformation behaviour of a few covalent crystal solids at the nanoscale level, such as diamond, silicon and silicon carbide.

In his previous research, Dr Lu and his team discovered ultra-large elasticity in nanoscale silicon and diamond. The goal of the new project is to identify a few "strain-tuned" covalent crystals with exotic, highly tuneable functional properties for unconventional electronic, optoelectronic and even quantum device applications.

The project will provide unprecedented detail and insights into how elastic strain engineering can effectively modulate the functional properties and performance of nanoscale solid materials in future device applications.

Dr Wang Feng, RFS awardee and Associate Professor in the Department of Materials Science and Engineering, will focus on advancing alternating current electroluminescence (ACEL) research to enable efficient and sustainable light generation.

ACEL is seen as a promising alternative to conventional light-generation methods based on direct current-driven electroluminescence (DCEL), as it is more cost-effective, robust and energy efficient. However, the lack of ACEL materials has hindered its development and practical applications.

The research led by Dr Wang will develop a new class of CaZnOS-based ACEL materials to replace conventional ZnS crystals. The two materials are similar in terms of composition, crystal structure and energy band gap, as well as expected optical properties. CaZnOS, which permits rare-earth doping, will provide new opportunities for designing advanced optoelectronic devices and establish important scientific ground for new basic research topics across the chemistry, materials and physics disciplines.

The purpose of the SRFS and RFS is to support exceptionally outstanding academics to facilitate their research efforts and promote research excellence. The awardees were selected based on the contribution and potential impact of the proposed research project, their proven research track record, and their leadership and vision, as well as the support of their university. Each SRFS and RFS awardee will receive a fellowship grant of about HK$7.8 million and HK$5.2 million, respectively, over a period of 60 months.