

2005 Young Scientist Awards Updates

Organizer

Hong Kong Institution of Science

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A total of 56 applications were received: 10 in Physical/Mathematical Science, 20 in Life Science and 26 in Engineering Science.

Three [Selection Panels](#), one in each field, had been set up to review the applications and performed initial screening. [Finalists](#) were asked to give oral presentation of their work for the final selection.

The Award winners will be announced at the presentation ceremony to be held during the HKIS Annual Conference on 29 October 2005.

Selection Panels

Physical/Mathematical Science Panel

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|-----------------|-------------------|--|
| <i>Chairman</i> | Prof. Qiang ZHANG | (Department of Mathematics, CityU) |
| <i>Members</i> | Prof. T.K. NG | (Department of Physics, HKUST) |
| | Prof. Jiming LIU | (Department of Computer Science, HKBU) |
| | Dr. Pauline LI | (Department of Appl. Biol. & Chem. Tech., PolyU) |

Life Science Panel

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|-----------------|---------------------|--|
| <i>Chairman</i> | Prof. Benjamin PENG | (Department of Biology, HKUST) |
| <i>Members</i> | Prof. M.C. FUNG | (Department of Biology, CUHK) |
| | Prof. Richard KONG | (Department of Biology and Chemistry, CityU) |
| | Dr. Stephen CHUNG | (Institute for Molecular Biology, HKU) |

Engineering Science Panel

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|-----------------|--------------------|--|
| <i>Chairman</i> | Prof. Allen CHWANG | (Department of Mechanical Engineering, HKU) |
| <i>Members</i> | Prof. J.M. KO | (Dean of Construction and Land Use, PolyU) |
| | Prof. S.P. WONG | (Department of Electronic Engineering, CUHK) |

Finalists

Physical/Mathematical Science

GU Hongwei 顧宏偉

Department of Chemistry, Hong Kong University of Science and Technology

Title of the Work: Biofunctional nanomaterials for pathogen detection

The work integrates biology, nanotechnology, and magnetism in developing a system for the detection of pathogens as well as a protocol utilizing biofunctional magnetic nanoparticles for capturing and separating proteins for applications in clinical diagnostics, biotechnology and biomedicine.

SZE Nung-sing 施能聖

Department of Mathematics, University of Hong Kong

Title of the Work: Study of preserver problem

Ten preserver problems on different topics in matrix and operator theory were studied and solved. Part of them was focused on linear preserver problems, which generalized several existing results, while another part was devoted to some new and interesting areas in preserver problems such as general preserver problems.

YANG Chun-lei 楊春雷

Department of Physics, The Chinese University of Hong Kong

Title of the Work: Study of spin-splitting in ferromagnetic semiconductor GaMnAs and nonmagnetic InGaAs/InAlAs two dimensional electron gas

This work focuses on the fundamental and important physics issues faced in realizing the semiconductor spintronic devices which are believed to be the next generation electronic devices using both the information of “charge” and “spin” of the electrons.

YEUNG Wai-kwok 楊偉國

Department of Orthopaedics & Traumatology, University of Hong Kong

Title of the Work: Development of a novel spinal implant for progressive scoliosis correction

This work includes study of NiTi alloy as orthopedic implantable materials, plasma surface engineering and enhancement mechanisms, factors affecting and optimization of surface biocompatibility and cell growth on plasma treated NiTi, promotion of osteogenesis, and the long-term effects in in-vitro and in-vivo environment.

Life Science

FENG Wei 馮巍

Department of Biochemistry, Hong Kong University of Science and Technology

Title of the Work: Structural studies of supramolecular complex assembly by neuronal scaffold proteins

This work relates to the structural studies of supramolecular complex assembly mediated by the multi-domain neuronal scaffold proteins. The structures of these supramodules, together with biochemical and molecular biology studies, provide mechanistic insights into the supramolecular assembly of neuronal signaling complexes.

KWAN Hiu-yee 關曉儀

Department of Physiology, The Chinese University of Hong Kong

Title of the Work: The regulatory roles played by protein kinase G in cardiovascular system

The elucidation of the regulatory roles of PKG in endothelial cells provides the essential basis for the understanding of cardiovascular diseases; the research findings can help to seek for novel pharmacological drugs that are much needed for the treatment of these increasingly common diseases nowadays

LIU Baohua

Department of Biochemistry, University of Hong Kong

Title of the Work: Genomic instability and premature aging of Zmpste24^{-/-} mice

This work demonstrated that unprocessed prelamin A caused by Zmpste24 deficiency and truncated prelamin A in HGPS result in defective DNA repair, which in turn leads to premature aging in mice and humans. This provided a better understanding to the molecular mechanisms of natural aging process.

Patti PANG 彭文慧

Department of Physiology, The Chinese University of Hong Kong

Title of the Work: Regulation of late-phase long-term potentiation in hippocampus

The present study has identified the very key players in late-phase long-term potentiation (L-LTP), the candidate for long-term memory formation in the brain. The data implies that mBDNF is a key molecule for long-term modification of hippocampal synapses. The results have provided the answer to a long-standing problem in neuroscience and also the basis for further probing into the nature of this fascinating subject.

Engineering Science

KWAN Yuk-ha 關玉霞

Department of Electronic and Information Engineering, Hong Kong Polytechnic University

Title of the Work: Dispersion managed soliton systems

The main objective in optical fiber communication research is to increase the channel capacity such that more information can be sent per unit time. The significance of this work is to establish that chirped fiber gratings can be used as dispersion compensators for high speed optical soliton communication systems.

LIANG Tak-keung 梁德強

Department of Electronic Engineering, The Chinese University of Hong Kong

Title of the Work: Optical amplifiers and nonlinear switching devices on silicon waveguides

This work has developed novel functional elements for silicon based photonic devices. The breakthrough in understanding the importance of nonlinear absorption losses has allowed the realization of the world's first optical amplifier using silicon as the optical gain medium. An ultrafast picosecond optical switch on submicron size silicon wire waveguides is developed.

LING Hang-yin 凌恆然

Department of Mechanical Engineering, Hong Kong Polytechnic University

Title of the Work: Embedded fibre Bragg grating (FBG) sensors for vibration and damage monitoring in advanced composite structures

This research is a cross-disciplinary work, including knowledge based on the mechanical, electrical and structural disciplines. The main focus is to develop smart composite structures with self-nerving systems by using embedded multiplexed fibre optic sensors. These systems are able to detect the static and dynamic responses of the structures due to the external excitations and thus the damage can be identified.

LU Lin 呂琳

Department of Building Services Engineering, Hong Kong Polytechnic University

Title of the Work: Investigation on characteristics and application of hybrid solar-wind power generation systems

This work develops an overall methodology for investigating the characteristics and applications of hybrid solar-wind power generation systems by applying simulation modeling, new technologies, new concepts and experimental validation. The developed programs have been utilized successfully to size and evaluate three hybrid solar-wind power generation systems for telecommunication relay stations in ShanWei, MeiZhou, and ZhuHai, Guangdong Province, China.

WONG Wing-han 黃詠嫻

Department of Physics and Material Science, City University of Hong Kong

Title of the Work: Polymer devices for photonics application

This work integrated material science and microtechnology engineering in developing novel approaches for the fabrication and characterization of guided wave devices based on polymeric materials for both passive and active applications, which thus enables the realization of a new generation of polymer devices, and opens up a new platform for more novel polymer planar lightwave circuit.

YUM Tsz-yin 任子賢

Department of Electronic Engineering, City University of Hong Kong

Title of the Work: High efficiency and linear RF front-ends for the next generation mobile communication system

The objective of this research is to accomplish RF functions at the lowest expenditure of energy and to improve both efficiency and linearity of transceivers in cell phones dramatically. The research was conducted from 800 MHz to 50 GHz, with particular emphasis on 0.8 – 3 GHz mobile communication frequency range.