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理學院通訊 Newsletter



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Prof. Poon Wai-yin Awarded Inaugural UGC Award for Teaching Excellence

Prof. **POON Wai-yin**, Associate Dean (Education) of the Faculty of Science and Professor in the Department of Statistics was conferred the inaugural UGC Award for Teaching Excellence by the University Grants Committee (UGC), in recognition of her outstanding teaching performance and achievements.

Prof. Joseph J.Y. SUNG, Vice-Chancellor of the University offered his heartfelt congratulations to Professor Poon, and said, "Having joined CUHK for over a quarter of a century, Professor Poon has been striving for innovation and perfection in teaching and research, exemplifying CUHK's pursuit of excellence. The honour that Professor Poon has won reaffirms the University's quality teaching and learning; and her dedication and passion has set an example for many teachers, inspiring them to enhance teaching effectiveness and motivating the local education sector to strive for continuous improvement."



Professor Poon delivers an acceptance speech.

Professor Poon felt deeply honoured to receive the award, and explained her vision of education, "We design ambitious and challenging curricula to stimulate students, but not at the expense of students of lesser capability. We embrace the concept of whole-person development, and use our classrooms to cultivate not only expertise but also generic skills and positive attitudes and values, and we feel obliged to extend our influence to the secondary-school sector."

Professor Poon adopts a student-centred approach and tailors teaching strategy to the nature of the class and attends to diverse learning needs and styles. Much loved by her students, Professor Poon sees it as her task to engage and motivate every student, helping them to build confidence and capability.

Deeply proud of Professor Poon's achievements, the Faculty gathered to celebrate and congratulate her on her success on 21 September 2011.



Members of the Science Faculty gathered to celebrate Professor Poon's achievement.

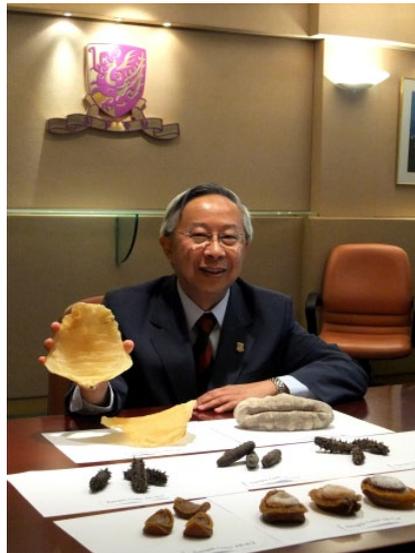




Innovative Platform for Authentication of Dried Seafood and Tonic Food Products Unveiled

At this year's Innocarnival 2011 and China High-Tech Fair (CHTF), the project 'First-Stage Development of Platform for Authentication of Dried Seafood and Tonic Food Products' led by **Prof. KWAN Hoi-shan**, Director of the Food Research Centre, CUHK, with a funding of HK\$3 million from the Innovation and Technology Commission of the Hong Kong Government has been unveiled. This project was developed for DNA-based authentication of common dried seafood and tonic food products in Hong Kong.

In his project, Professor Kwan develops a platform and database for DNA-based species authentication of common dried seafood and tonic food products in Hong Kong by providing essential DNA information that can be used by the government authorities, local industry and testing centres. The platform will enable the industry to regularly monitor and verify the origins and species of these products



Prof. KWAN Hoi-shan's authentication platform aims to enhance the local industry's reputation while boosting consumer confidence.

and will also provide the authorities concerned with molecular references. Such efforts are deemed useful to curb mislabelling and fraudulent substitution in the local market. The project will help enhance the reputation of the local industry and boost the confidence of the public and tourists in purchasing these products in Hong Kong. In the long-term, the platform will serve as an important foundation for setting up a comprehensive food safety and quality management system for food products.

The platform being developed will provide both essential morphological data and DNA sequence datasets for species authentication of major dried seafood and tonic food products being sold in the local market. Apart from a diagnostic kit for DNA-based species authentication, a rapid kit that enables quick differentiation of genuine and fake products will also be developed for front-line quality control. In the future, a comprehensive Food DNA Database will also be developed to facilitate authentication of other food products.

Hundreds Attend Renowned Mathematician YAU Shing-tung Lecture

On 27 October 2011, world-famous Mathematician **Prof. YAU Shing-tung** returned to the CUHK to give a talk entitled "Math, Physics, and Calabi-Yau Manifolds." The only Chinese scholar to have been awarded two of the highest distinctions in the mathematics arena - the Fields Medal and the Wolf Prize in Mathematics - Professor Yau is Distinguished Professor-at-Large and the director of the Institute of Mathematical Sciences at the CUHK.

Professor Yau's talk drew an audience of a wide age range, from both within and outside the University. Over 350 audience members listened to Prof. Yau's talk eagerly. Many felt fortunate to have had the



Prof. YAU Shing-tung's public lecture attracted more than 350 participants.

chance to attend a lecture by such a prominent world-class scholar.





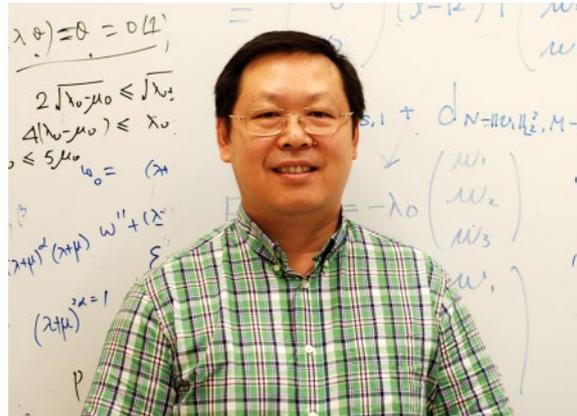
Laws in Beauty: *the Magic of Maths*

Some of you may remember that at the beginning of *A Beautiful Mind*, a film about the legendary mathematician John Nash, the male protagonist positions a drinking glass against the sun so that the refracted light falls on the necktie of his schoolmate. The budding mathematician muses, 'There could be a mathematical explanation for how bad your tie is.'

Innocent as this quip may seem, **Prof. Wei Juncheng** of the Department of Mathematics at CUHK would not hesitate to add that natural phenomena can also be explained in mathematical terms and mathematics is the tool for everything ranging from physics, life to finance. The refraction of light in the above example can be explained by the Maxwell Equations. The spots on deer and leopards, and the stripes on clownfish and zebras are all translatable into a set of partial differential equations for the Reaction-Diffusion Systems. Partial differential equations come in handy because a differential operator is needed to express the relationship of a variable with time and space.

Let's look at the animals. Whether we find spots or stripes on their bodies is a result of the distribution and concentration of the molecules of a pigment in the medium of another pigment and the interaction between their molecules. Reaction-diffusion equations can explain the interaction between two media, in different proportions, and how one medium is distributed or aggregates in another medium. They can be used to explain the spots or the stripes found in animals, or even the moles and spots on human skin that may change colour or migrate with time.

When the proportion of two media is more balanced, the mathematical solution of the reaction-diffusion equation would just result in stripes. When the



Prof. WEI Juncheng has published over 250 publications, and he was included in ISI Highly Cited (2010).

proportion is more extreme, the result would be spots. Thus, both stripes and spots can be described with a pair of reaction-diffusion equations. In other words, the pigments of orange and black on a clownfish are balanced in

proportion and result in the stripes we see on it. If the orange pigment dominates, the equation would tell us that the black pigment would aggregate in the form of spots and we would have a clownfish with leopard-like spots. However, simple physical phenomena can be easily explained by relatively simple mathematical equations. With the increasing complexity of other phenomena, more sophisticated mathematical methods are required.

Prof. Wei Juncheng is one of the leading figures in the field of partial differential equations, particularly in the analysis of concentration phenomena in nonlinear elliptic equations and systems. The de Giorgi Conjecture is one of the most famous conjectures in pure mathematics, proposed by the Italian mathematician Ennio de Giorgi in 1978. It concerns the structure of certain nonlinear equations and had puzzled mathematicians around the world. Up to 2006, the conjecture was shown to be true in the second to the eighth dimensions. Thus researchers generally held that the conjecture would apply in any number of dimensions. Through an ingenious mathematical method, Professor Wei and his team were able to find a counter example in the ninth dimension and show that it could not have applied in any dimension higher than the eighth.

Credit: **CUHK Newsletter Issue no. 385**, 19.10.2011.





Recent Honours

CUHK Ranks 15th in World for Mathematical Sciences

In a ranking published by the Times Higher Education in June this year, the CUHK ranked 15th in the world in mathematical sciences (namely **mathematics** and **statistics**). The results were based on data from the Essential Science Indicators, where the top schools out of 20,000 institutions had been ranked according to citations per paper for the

period of 1 January 2001 to 28 February 2011. The Science Faculty is proud to have such dedicated researchers working to advance the progress of science.



Prof. Edwin CHAN Ho-yin Receives Genetics Award

In August, **Prof. Edwin CHAN Ho-yin** of the School of Life Sciences was awarded the 13th Ju-Chi Li Animal Genetics Prize (「第十三屆李汝祺動物遺傳學優秀論文獎」) from the Genetics Society of China. Designed to recognize young geneticists' contribution to the understanding of animal genetics and to encourage innovation, only two awards are given out each year. Some past recipients of this award are now members of the Chinese Academy of Sciences. Professor Chan was the recipient of the CUHK 2009-2010 Young Researcher Award.



Prof. Edwin CHAN Ho-yin (first from left) received the 13th Ju-Chi Li Animal Genetics Prize from the Genetics Society of China.

Students Win Gold Medal at iGEM Asia

A genetic engineering team formed by undergraduate students of science and engineering at The CUHK won a gold medal at the iGEM (International Genetic Engineered Machine) Asia Regional Jamboree. The team also won the Best BioBrick Measurement Approach and the Best New BioBrick Part (Natural) awards. With their outstanding performance at the Asia Regional Jamboree, the team advanced to the world championship held at the Massachusetts Institute of Technology (MIT) on 5 - 7 November.



The award-winning team and their coaches

students, four engineering students and one **chemistry** student. This interdisciplinary team conducted synthetic biological research on the theme of renewable energy and studied how the use of solar energy could solve certain problems in two major environmental issues: water and energy.

The team's work showed great creativity and a thorough exploration of the BioBrick, and was highly commended by the panel judges.

This year's CUHK team comprises seven coaches and 24 undergraduate students, including 19 **life sciences**

For further information, please visit the **CUHK iGEM 2011 Website**.





Biology Student Attends 2011 Wu Ta-you Science Camp

T **TSANG Ho Leung Ryan** (Year 4, Biology) represented the Faculty to attend the 2011 Wu Ta-you Science Camp. Held between 7 - 12 August in the NTU Experimental Forest in Nantou County, this year's camp theme was "Ecology & Evolution: Current Issues and Their Importance to Mankind."

Camp participants came from all over China, Taiwan, and Hong Kong. Ryan was one of two participants from The CUHK, and he wrote to share his camp experience:

"I am glad to have had the opportunity to participate in the Wu Ta-you Science Camp. Through this camp, I got a valuable chance to talk face-to-face with the experts in the field of ecology and evolution. From the lectures, not only did I learn



TSANG Ho Leung Ryan (back row, second from right) is seen here striking a pose with fellow campers and Prof. Steven W. RUNNING of the University of Montana.

new knowledge in the field, but I also learned from them the right attitude to study science, and how to use it to affect the world, thus making our world a better place for us all!"

Faculty Retreat on Strategic Planning

The Faculty Strategic Planning Meeting was successfully held on Saturday, 22 October at the Jockey Club Shatin Clubhouse. The Faculty was honoured to have **Prof. Sunney Chan** (front row, second from left) - special advisor to the Dean - join us for the event.



Upcoming Events

How to Win a Nobel Prize?

Last November, the Faculty of Science gave an inaugural series of public lectures explaining the science behind Nobel Prize-winning research. This year, the Faculty is pleased to offer two such talks again to senior secondary students, shedding light on how research on the immune system and the accelerating expansion of the Universe won researchers the prestigious Nobel Prize in Physiology or Medicine and in Physics respectively. Details of this year's event are as follows:

Popular Science Special Lecture Series: How to Win a Nobel Prize?

- Date:** Friday, 25 November 2011
Time: 17:00 - 18:30
Venue: Lecture Theatre 1, Cheng Yu Tung Building, The CUHK
Talks: The Accelerating Expansion of the Universe
Presented by: **Prof. CHU Ming-chung** (Department of Physics)
Our Frontline Immuno-killers: Dendritic Cells and Toll-like Receptors
Presented by: **Prof. KONG Siu-kai** (School of Life Sciences)





CUHK Alumni Homecoming 2011

The Science Faculty will be welcoming back our alumni at the CUHK Alumni Homecoming 2011 on Sunday, 4 December. The Faculty will be hosting a tea reception to reunite our alumni with their old classmates and teachers, and this activity will surely be one of the event's highlights.

Science Faculty Programme:

TIME	ACTIVITY	VENUE	REMARKS
12:00 – 17:00	Booths	University Mall	Organized by the Faculty of Science, the Chinese Medicine Alumni Association of the CUHK, and the CUHK Physics Alumni Association
13:30 – 14:00	Lab Tour for Chemistry Alumni	Rm. G53 – G54, Ma Lin Building, Science Centre	--
14:00 – 16:00	Science Faculty Tea Reception: Gathering of Alumni and Teachers	CN Yang Reading Room (Rm. 126, Charles Kao Building, Science Centre)	--
14:00 / 14:45 15:45 / 16:30	Talk and Tour at the Chinese Herbal Garden	Chinese Herbal Garden	<ul style="list-style-type: none"> • Self-guided tour • Talk on Chinese herbs • Talk on growing organic Chinese herbs and medicinal fruits
16:30 – 18:00	Physics Café	CN Yang Reading Room (Rm. 126, Charles Kao Building, Science Centre)	Materials Science and Physics Alumni Gathering
18:00 – 22:00	10-Year Graduation Reunion	University Guesthouse	2001 CUHK Physics Alumni are cordially invited

If you're interested in attending the **2011 CUHK Alumni Homecoming**, please register [online](#).

Welcome back, Alumni and Retired Faculty!

理學院通信 Faculty of Science Newsletter

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