

FEB 2015

HKUST JOCKEY CLUB

IASS

NEWSLETTER

INSTITUTE FOR ADVANCED STUDY



YOUTH UNEMPLOYMENT AND LABOR MARKETS IN A NUTSHELL

Prof Sir Christopher Pissarides



2014 has been a productive year for IAS. We take pride in organizing 12 cutting-edge topical research programs during the year, covering highly specialized areas in Physics, Mathematics, Engineering and Chinese Literature. We look forward to having more in 2015.

You may wonder: What exactly is a topical research program?

Building on its unique platform for promoting world class scholarly research activities, IAS aspires to make itself an international center for running topical research programs. Program running is a research format new to Hong Kong but has proven to be highly successful elsewhere. Since 2011 when IAS introduced the first topical research program to Hong Kong, IAS has been running programs to attract top talents around the world to gather at IAS for extended visits to exchange ideas and brainstorm in various highly specialized disciplines. An IAS program, which may last from a week to a full academic term, usually consists of short courses, workshops, and in some cases postdoc-led / postgraduate student-led discussion sessions. Participants from overseas, of whom the majority of those are prominent scholars, will be in residence at IAS to interact with the local academics and students. Innovative ideas and projects naturally emerge under an atmosphere conducive to mind opening. Working together with the best and brightest talents in the respective disciplines, academics in Hong Kong may start or develop research collaborations with overseas participants, thereby promoting research excellence in Hong Kong. The horizons of the young scholars and postgraduate students in Hong Kong will be significantly broadened as they have the opportunity to interact face-to-face with and learn from a group of academic leaders in their areas of study in a holistic manner. Through these excellent opportunities to connect with these great minds, it is not only an intellectually inspiring experience but also creates possibilities for the young people in Hong Kong to follow world renowned academics to further develop their potentials. The process may as well facilitate communication and dissemination of results to the wider community of scientists and non-experts.

In addition to program running, we took pleasure in having received over 30 IAS Visiting Professors and Fellows; organized close to 120 lectures, seminars, workshops and conferences; and hosted 4 Gordon Research Conferences in 2014. We congratulated our Visiting Professors for being accorded the highest honors in science: Fields Medal (Manjul Bhargava) and Nobel Prize in Physics (Shuji Nakamura).

While keeping our momentum going in 2015, we will further our efforts to attract top talents to join HKUST. We are working hand-in-hand with the Office of the Vice-President for Research and Graduate Studies to identify top PhD graduates to take up Research Assistant Professorships. We seize every opportunity to get on board the most sought-after world class scholars to become IAS Professors. Please read on to learn more about us. We welcome your nominations of suitable candidates and proposals for activities - please refer to p.24 for details. We cherish your insights to make IAS your partner for research excellence!

Henry Tye

Director
HKUST Jockey Club Institute for Advanced Study

Youth Unemployment and Labor Markets in a Nutshell AN INSPIRING CHAT WITH PROF SIR CHRISTOPHER PISSARIDES



Prof Sir Christopher Pissarides is a leading economist specializing in the economics of labor markets, macroeconomic policy, economic growth and structural change. He was awarded the 2010 Nobel Prize in Economics, jointly with Prof Dale Mortensen of Northwestern University and Prof Peter Diamond of Massachusetts Institute of Technology, for their work in the economics of markets with frictions. Sir Christopher is the Regius Professor of Economics at the London School of Economics and Political Science, Professor of European Studies at the University of Cyprus, Chairman of the Council of National Economy of the Republic of Cyprus, and IAS Helmut & Anna Pao Sohmen Professor-at-Large at the Hong Kong University of Science and Technology.

IAS

As a world class economist focusing on employment, could you share with us why you chose this particular field for research? How do you approach a question in research?

CHRIS

When I started my study and research, we were experiencing for the first time rising unemployment after the end of the Second World War. There was so much destruction in the war that people worked hard to reconstruct their countries in its immediate aftermath. As a result, the unemployment rate in the western world dropped down to 1-2%. But it started to rise in the early 1970s, as reconstruction came to an end and industrial growth began to slow down. Like most other economists, I was puzzled why it was happening and thought it would be an important problem to explain.

My concern was that economists were not using the optimizing principles of microeconomics to explain unemployment. They used a top-down approach, asking how much demand is there, how many people do you need to produce that quantity, how many people are there seeking work, and therefore what is the leftover, if any? I decided to go in the opposite direction, starting from the optimization calculus of firms and workers and aggregating to the whole economy, to discover how many people are left without a job.

IAS

Youth unemployment seems to have become a common phenomenon in many places. What do you think the main cause is and what the government can do to resolve it?

CHRIS

To analyze youth unemployment, we adopt a bottom-up approach starting from the micro-foundations -- individuals. By comparing the incentives of young people with those of adults who are aged over 25 in the labor market, we can see young people experience more unemployment. The reason is that young people have more incentives to experiment with jobs until they find the job that they like most. Their experience is similar to "job shopping". This phenomenon is optimal because it helps people find the jobs at which they are more productive and yield them higher incomes. In developed countries, it is normal to have a youth unemployment rate that is double the overall unemployment rate.

The situation that causes youth unemployment a real problem is economic recession. If a country gets hit by recession triggering an increase in the unemployment rate to 25%, the youth unemployment rate would probably get worse to 50%. This is not due to job shopping but rather to firms not creating enough jobs for young people to try out. The companies are now "people shopping". When the problem arises, the government should

help the young unemployed with temporary support. For example, the German government subsidizes companies to hire young people as apprentices. Other means of support exist but the extra support should be given through the market, not as unconditional income transfers.

IAS

Do you find any interesting or significant differences between the European labor market and Asian or Chinese labor market?

CHRIS

Labor markets comprise people, companies and a legal institutional structure. In terms of people and companies, all labor markets have similar characteristics since human nature is to engage in the labor market for the maximum reward. Even though people are of different cultures, they share the same aims, which as a by-product improve productivity and lower production costs.

The critical difference between the markets is in the legal structure. In Europe, the labor market is relatively free from direct government intervention while the governments provide social support to those left out of the labor market like the unemployed and the disabled. We call this system "laissez-faire", which means free market. However, in China, the state is following a more paternalistic approach towards its people, through land allocation and a large number of state enterprises. In order to compete with other countries, China must reform its labor market to keep up with the fast growth rate in economy.

China needs a more up-to-date financial structure. In the West, finance is usually driven by private incentives. There are large management consulting firms that advise on the running of business and wealthy individuals who act as "business angels", supporting with financing new and riskier ventures than those that can be supported by banks. Such a structure is absent in China. The ruling party is the

one that dominates in the approval of large-scale investments. They tend to avoid taking large risks, which might inhibit the growth of more modern technologies that can successfully compete internationally.

IAS

What is your impression on Hong Kong students?

CHRIS

Hong Kong students are very motivated and serious in their studies. I am impressed that they are really interested in learning, not just to pass the exams. I enjoyed interacting with them in lectures and talks. They are keen to understand how things work. I always get along well with Chinese students since many of my students in London are from Asia. They

IAS

How do you see IAS's role on nurturing young talents?

CHRIS

With the beautiful surroundings here, IAS has provided a comfortable and conducive environment for students to work and interact with faculty members. This place, the facilities that it offers and its environment, are as close as one hopes to get to perfection for researchers and students wishing to learn.



Sir Chris interacting with students after delivering an IAS Commons talk on "The New Normal in China: Lessons from Europe" on 29 Sep 2014.

Lighting up Our Lives - Blue LED

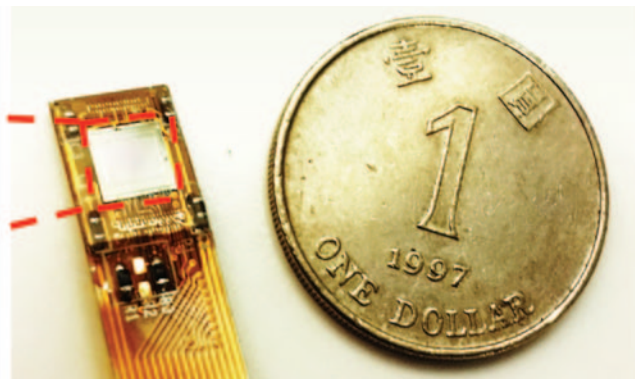
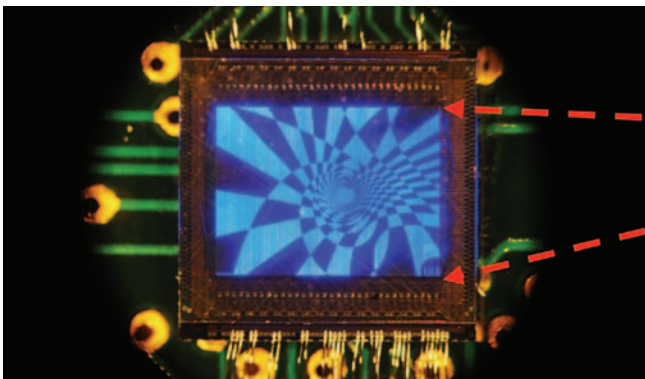
By **Xinbo Zou (IAS Junior Fellow)** and
Wing Cheung Chong (PhD Student, Department of Electronic & Computer Engineering, HKUST)

The 2014 Nobel Prize in Physics went to three scientists and engineers, Profs Isamu Akasaki, Hiroshi Amano, and Shuji Nakamura for their invention of energy-efficient and environment-friendly blue light-emitting diode (LED). A natural question from readers might be, "Why blue in particular, but not LEDs in other colors?"

In addition to completing the visible spectrum to make full color displays, the significance of blue LEDs lies in the fact that one can create white light for general illumination using blue light either to combine with red and green light, or to excite yellow phosphor powders. However, in the history of LED development, blue LEDs were really missing for a long time. Gallium arsenide phosphide (GaAsP) is the material to produce LEDs emitting light from infrared to green, but not for blue LEDs, in which higher-energy photons are involved. While Gallium nitride (GaN) was considered by many labs to be the suitable semiconductor for emitting blue light, it was in practice extremely difficult to obtain high quality GaN crystal until the 1990s, let alone functional GaN-based LEDs.

The breakthroughs in creating GaN crystal happened in late 1980s and early 1990s. In 1986, Prof Isamu Akasaki and Prof Hiroshi Amano of Nagoya University achieved mirror-like GaN crystal on a sapphire substrate using an aluminum nitride (AlN) buffer layer by metal organic chemical vapor deposition (MOCVD). Simultaneously, Prof Shuji Nakamura (who was then working at Nichia Chemical Industries Ltd. and later became Professor at the University of California at Santa Barbara in 1999 and IAS Visiting Professor in 2008) managed to grow high quality GaN crystal by replacing the AlN buffer with a low-temperature GaN buffer and subsequently through a thermal annealing method achieved p-type GaN which is essential in producing p-n junction GaN LEDs.

As a matter of fact, soon after the growth and fabrication of p-n junction GaN LEDs emitting at 430 nm, InGaN/GaN multiple-quantum-well (MQW) LEDs were created with much improved optical output power. The heart of a GaN LED is made of semiconductor materials in a layer by layer manner: an active layer (e.g. MQWs) is sandwiched by an



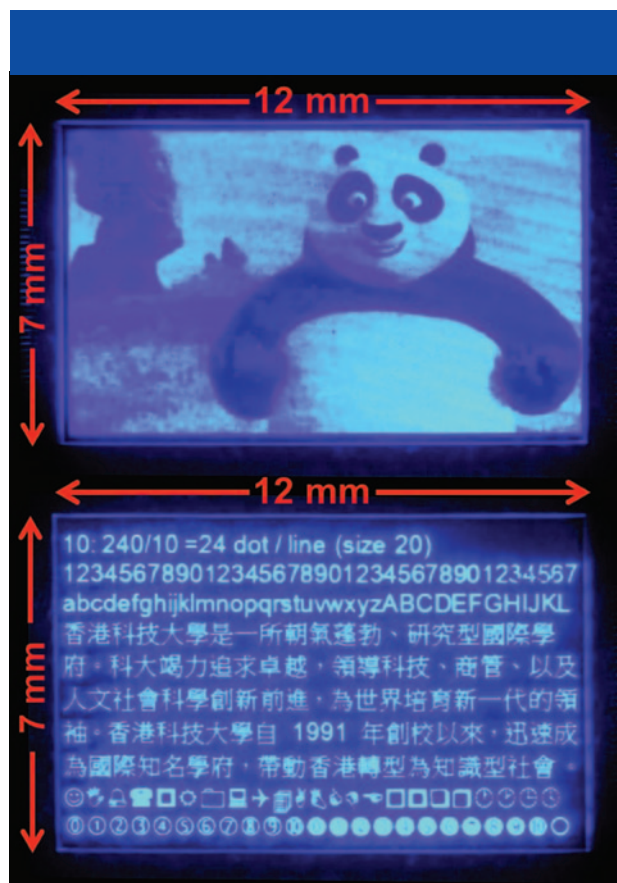
0.19 inch 1,700 pixels per inch (PPI) high resolution passive-matrix Light Emitting Diode on Silicon (LEDoS) micro-display for wearable electronics such as head-mounted display.

n-doped GaN layer (with a surplus of electrons) and a p-doped GaN layer (with a surplus of holes). When a forward voltage is applied between p-GaN and n-GaN, the holes and electrons are driven into the active layer where they meet (recombine) and transform into photons (light). Prof Nakamura was instrumental in tuning these technological breakthroughs into viable products for various applications.

As material and fabrication technology matured in the last two decades, high-brightness blue LEDs started to revolutionize the illumination technology as a competitive light source. In 2014, the highest LED luminous efficacy has hit 303 lumens per watt (lm/W) in the laboratory, which is more than 18 times of conventional incandescent bulbs (16 lm/W) and 4 times of fluorescents (70 lm/W). With the features of low power consumption, long lifetime (up to 100,000 hours), minimum maintenance, and non-toxicity (no mercury contained), LEDs are used in a large number of applications including traffic signals, display backlights, automobile headlights, street lightings, and general indoor lightings.

Established and led by Prof Kei May Lau, IAS Senior Fellow in the Department of Electronic & Computer Engineering at HKUST, the Photonics Technology Center (PTC) has been carrying out research in GaN-based LEDs since 2001. Researchers in PTC have invented a high-resolution LED display technology, without any liquid crystal or organic materials. The first 0.19 inch 1,700 pixels per inch (PPI) passive-matrix GaN-based light-emitting diodes on silicon (LEDoS) micro-display and the highest resolution (400 × 240) active-matrix LEDoS micro-display were

demonstrated in 2014. LEDoS micro-display is more advantageous in terms of brightness, power efficiency, lifetime, thermal stability, and robustness in extreme conditions. The main applications of LEDoS include head-up display, head-mounted display and projector.



High power and high resolution (400 × 240) active-matrix LEDoS micro-display as an alternative solution for projectors.



Prof Shuji Nakamura receiving the Nobel Prize at the Stockholm Concert Hall in the 2014 Prize Award Ceremony.
© Nobel Media AB Photo: Alexander Mahmoud

IAS Visiting Professor Shuji Nakamura awarded Nobel Prize

IAS congratulates its Visiting Professor Shuji Nakamura on being selected as one of the three laureates of the 2014 Nobel Prize in Physics by the Royal Swedish Academy of Sciences. Prof Nakamura was awarded for "the invention of efficient blue light-emitting diodes which has enabled bright and energy-saving white light sources".

Honored as the "Father of blue LED", Prof Nakamura is widely recognized as pioneer in light emitters based on wide-bandgap semiconductors. He invented the first high brightness GaN LED whose brilliant blue light is (when partially converted to yellow by a phosphor coating) the key to white LED lighting, and which went into production in 1993. With blue LED, long-lasting white light can be created in a more efficient, environmental friendly and cheaper way which indicates a revolution in the illumination technology.

IAS VISITING PROFESSOR CONFERRED HKUST HONORARY DOCTORATE



Prof Chih-Ming Ho at the HKUST 22nd Congregation 2014

IAS Visiting Professor Chih-Ming Ho was conferred honorary doctorate of Engineering in HKUST's 22nd Congregation held on 7 November 2014. Prof Ho is currently the Ben Rich-Lockheed Martin Chair Professor at the University of California at Los Angeles. He is widely recognized as a global front-runner in fluid mechanics, and has also pioneered advances in microfluidics and biomolecular sensors, among other areas. He is ranked by the Institute

for Scientific Information (ISI) as one of the top 250 most cited researchers worldwide in the entire engineering category. Prof Ho joined IAS as Visiting Professor since 2011 and has given distinguished lectures to the public on bio system technologies. He collaborates with Profs Karl Tsim of Life Science and Yi-Kuen Lee of Mechanical & Aerospace Engineering at HKUST on Traditional Chinese Medicine research.

Throughout the years, there are eight IAS Visiting Professors who have received HKUST honorary doctorates:

IAS Visiting Professor	Honorary Degree	Year
Prof Chih-Ming Ho	Doctor of Engineering <i>honoris causa</i>	2014
Prof Marvin Cohen	Doctor of Science <i>honoris causa</i>	2013
Prof Evelyn Hu	Doctor of Engineering <i>honoris causa</i>	2013
Prof Bright Sheng	Doctor of Humanities <i>honoris causa</i>	2013
Prof Eli Yablonovitch	Doctor of Engineering <i>honoris causa</i>	2011
Prof Aaron Ciechanover	Doctor of Science <i>honoris causa</i>	2008
Prof Shuji Nakamura	Doctor of Engineering <i>honoris causa</i>	2008
Prof Yuen-Ron Shen	Doctor of Science <i>honoris causa</i>	1997

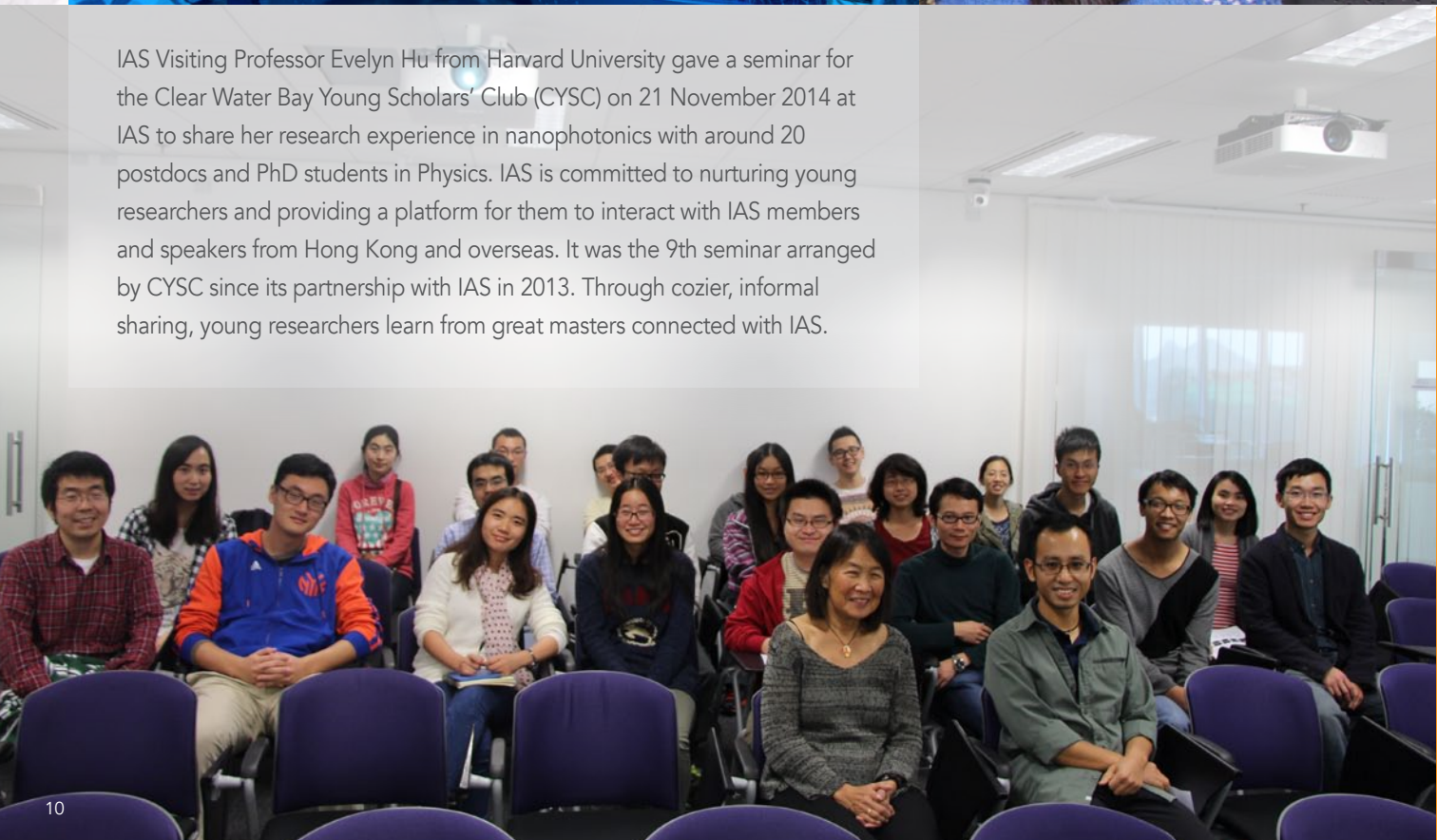


Prof Bright Sheng (2nd from left), Prof Marvin Cohen and Prof Evelyn Hu (2nd and 3rd from right) were awarded HKUST honorary doctorates in 2013.



Care and Share

IAS Visiting Professor Evelyn Hu from Harvard University gave a seminar for the Clear Water Bay Young Scholars' Club (CYSC) on 21 November 2014 at IAS to share her research experience in nanophotonics with around 20 postdocs and PhD students in Physics. IAS is committed to nurturing young researchers and providing a platform for them to interact with IAS members and speakers from Hong Kong and overseas. It was the 9th seminar arranged by CYSC since its partnership with IAS in 2013. Through cozier, informal sharing, young researchers learn from great masters connected with IAS.



Round Trip of the Father of OLED:

BETWEEN HONG KONG AND USA



At a forum organized by the Undergraduate Recruitment and Admissions Office (URAO) for high school principals, IAS Bank of East Asia Professor Ching W. Tang shared his success story as the inventor of organic light emitting diodes (OLED).



More than 50 representatives from local secondary schools attended the URAO forum on 8 January 2015 and shared experience on JUPAS admissions. At the ensuing luncheon hosted by President Tony F. Chan, Prof Tang delivered a keynote speech titled "The Story of OLED (Born in Hong Kong, Made in USA)". Grown up in a Yuen Long village where scarcity of electricity used to be common, an innovative mindset has been nurtured within Prof Tang since his childhood. He revealed the evolution of OLED and how it took more than 50 years to emerge as a prominent display technology. Amongst the audience were current principals of Prof Tang's *almae matres*, King's College and Yuen Long Public High School.

PARTY TIME!

To celebrate the joy of the winter holidays, IAS threw a casual stand-up buffet lunch party on 15 December 2014 at IAS G/F Lobby. Around 140 people, including IAS directorate, faculty, postdocs and staff, IAS Senior Fellows and Fellows, IAS visitors in residence, colleagues from the Institute for Emerging Market Studies, and Leadership and Public Policy Executive Education, as well as participants of the IAS Focused Programs on Physics Approach to Simplifying Complexity in Biology, and Multiscale Modeling and Simulation of Defect Problems in Materials Science gathered under the same roof, mixed and mingled light-spiritedly with one another while enjoying local delicacies and festive cuisine.





IAS Program on Chinese Creative Writing

It was the second year IAS collaborated with the School of Humanities and Social Science and the Division of Humanities in the IAS Program on Chinese Creative Writing. During the Fall term of 2014, renowned Chinese writers and literary scholars participated in a series of activities. Mr Xingjian Gao, the first Chinese Nobel Laureate in Literature, visited HKUST in October. In addition to an international workshop to discuss Mr Gao's literary works and a screening of his rock musical "Of Mountains and Seas", he also had a profound dialogue with IAS Senior Visiting Fellow Zaifu Liu. In November, two other talks were given by three-time winner of Lu Xun Literary Prize Zijian Chi and the 2014 Franz Kafka prizewinner Lianke Yan, who also joined our program in 2013.





IAS Focused Program on Neural Engineering

Neural Engineering is a new discipline interfacing between neurobiology, engineering and physical sciences. This area creates working opportunities for engineers and scientists to address issues in the brain that were considered too difficult to comprehend. Neural engineering offers promises to fight neurodegenerative diseases with devices and it lays foundations for many great engineering applications using bio-inspired engineering principles.

A focused program on Neural Engineering consisting of a 5-day short course and a 4-day focused program was held on 3-13 November 2014. Taught by Prof Tom Daniel, IAS Senior Visiting Fellow from University of Washington, the intensive short course acted as a foundation to introduce the emerging research domain of neural engineering. The following focused program co-led by Prof Daniel and Prof I-Ming Hsing, Head of Division of Biomedical Engineering and Professor of Chemical & Biomolecular Engineering at HKUST, lined up experts of various sub-disciplines from North America and Asia to brainstorm, interact and discuss cutting-edge research topics in the discipline. The breakout sessions on the last day were the key to stimulate future collaborations between the universities on the advancement of neural engineering.



IAS Focused Program on Scattering Amplitudes in Hong Kong

IAS held a focused program on Scattering Amplitudes in Hong Kong on 17-21 November 2014 which was the first major workshop in Asia devoted to recent advances in scattering amplitudes in quantum field theory.

Attended by over 50 overseas participants from US, Europe, Korea, Mainland China and Taiwan, the program served as an excellent platform for more than 30 speakers delivering talks in topics in new perturbative approaches such as generalized unitarity, recursion relations, symbols, differential equations, twistor variables, integrability methods and the operator product expansion (OPE), scattering equations, the amplituhedron and the positive Grassmannian, color-kinematics duality and gravity double-copy properties, etc. These ideas have led to substantial progress, not only in supersymmetric gauge and gravity theories, but also in the ability to perform difficult phenomenologically relevant calculations for Large Hadron Collider (LHC) physics.

Attracted around 100 attendees, the IAS Distinguished Lecture incorporated in the program given by Prof Nima Arkani-Hamed, Professor of School of Natural Sciences, Institute for Advanced Study at Princeton, entitled "Spacetime, Quantum Mechanics and Scattering Amplitudes" was the highlight of the program. With an aim of introducing the topic of scattering amplitudes to a new young generation of young theorists in Asia, the 5-day program has fulfilled its mission and benefited both the local and non-local scientific communities.





IAS Focused Program on Bio-inspired Flight System and Bio-inspired Autonomous System



Bio-inspired engineering seeks sustainable solutions by emulating nature's time-tested patterns and strategies. This new big engineering combines the disciplines of biology and technology or other fields of innovation with the goal of solving practical problems through the abstraction, transfer, and application of knowledge gained from biological systems by interdisciplinary cooperation. To initiate in-depth discussion, a focused program on Bio-inspired Flight System and Bio-inspired Autonomous System was held at IAS from 24 November to 3 December 2014.

An introductory 5-day short course taught by Prof Hao Liu, IAS Visiting Fellow from Chiba University first opened participants' minds to integrate different aspects of biology, computing, mechanical, and aeronautical engineering to formulate the basis of bio-inspired engineering. The latter 3-day focused program featuring both local professors and researchers from US, India, Japan and Mainland China inspired the developments of mechanisms and applications through fruitful talks, active discussions and knowledge exchanges.



IAS Focused Program on Multiscale Modeling and Simulation of Defect Problems in Materials Science



Tremendous progress has been made in recent years on multiscale modeling and simulation of defects in materials science, such as correlations among defect structure, energetics and dynamics, and influences of defects on the properties of the materials.

On 15-19 December 2014, the IAS Focused Program on Multiscale Modeling and Simulation of Defect Problems in Materials Science was held to promote interdisciplinary research collaborations among mathematicians and materials scientists. Led by Prof Yang Xiang, Prof Tim Leung, and IAS Senior Fellow

Prof Xiaoping Wang from the Department of Mathematics, this 5-day program gathered over 30 distinguished scholars and experts from different areas. Experts and research groups who have been very active in this field shared their thoughts and experience on topics including problems of defects such as grain boundaries, materials surfaces, dislocations, fluid-solid and biological interfaces, and techniques of mathematical analysis and numerical simulations.



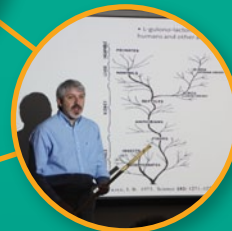
IAS Focused Program on Physics Approach to Simplifying Complexity in Biology



Spearheaded by IAS Visiting Professor Robert Austin from Princeton University, a 5-day focused program on Physics Approach to Simplifying Complexity in Biology was held on 15-19 December 2014 at IAS.

Participated by approximately 50 participants from US, Chile, France, Germany, India, Japan, Korea, Mainland China and Poland, the program was a continuation of the IAS Workshop on Evolution: Foundations, Fundamentals, and Disease previously held in December 2009 in which the limits of neoclassical evolution dynamics were explored. That workshop laid the seeds for the creation of the Physical Science - Oncology Centers of the US National Cancer Institute, which aimed to view cancer evolution dynamics from an entirely new perspective.

Over 20 distinguished scholars and experts, including Prof Paul Davies from Arizona State University, delivered their talks and research findings in the program which tied together three fundamental physics ideas that emerged from the previous workshop: first, the thermodynamics of systems far from equilibrium in complex environments, second, the dynamics of evolving systems in complex environments, and third, communication between evolving agents. These subject areas offer a rich meeting ground for physicists and biologists to probe fundamental questions regarding the complexity of life in a hard-science manner.



IMA – HK – IAS Joint Program on Statistics and Computational Interface to Big Data

Big Data arises from many frontiers of scientific research and decision and policy making. It holds great promise for the discovery of heterogeneity in the population for personalized treatments and services as well as possibly weak patterns in possibly heterogeneous populations. It involves any voluminous amount of structured, semi-structured and unstructured data that has the potential to be mined for information. Big Data is an interdisciplinary area that requires collaborations and cross-fertilizations among Applied Mathematics, Computer Science, and Statistics. Recognizing the importance of Big Data, IAS organized the IMA-HK-IAS Joint Program on Statistics and Computational Interface to Big Data on 4-16 January 2015, receiving co-sponsorships from the Institute for Mathematics and its Applications (IMA) at the

University of Minnesota, the Center for Statistical Science, the Department of Mathematics and the Department of Computer Science & Engineering at HKUST.

Coordinated by IAS Visiting Professor Jianqing Fan from Princeton University, IAS Visiting Professor Thomas Hou from California Institute of Technology, Prof Bingyi Jing from HKUST and Prof Eric Xing from the Carnegie Mellon University, the program brought together 22 keynote speakers and 25 invited speakers from Applied Mathematics, Computer Science and Statistics to share their research findings. The program includes two short courses, a 6-day workshop and a 1-day mini-workshop, attracting over 140 participants from Hong Kong and overseas.



IAS Program on The Future of High Energy Physics

IAS co-organized a program on the Future of High Energy Physics from 5-30 January 2015 together with the Center for Future High Energy Physics (CFHEP) and Institute of High Energy Physics (IHEP) of the Chinese Academy of Sciences (CAS). As part of the program, a 4-day conference was held on 19-22 January 2015 to encourage more intensive and dynamic discussions.

Attended by more than 100 participants from institutions in US, Europe, India, Japan, Korea,



Mainland China, Taiwan and Hong Kong, the program served as an excellent platform for theorists, experimentalists and accelerator physicists to exchange information and stimulating thoughts. Highlights of the program include the IAS Distinguished Lecture incorporated to the program given by Prof Yifang Wang, Director of IHEP, CAS as well as a summary talk given by Prof Nima Arkani-Hamed of Institute for Advanced Study at Princeton and Director of CFHEP.

Upon completion of the program with over 50 talks and 2 panel sessions in the conference, white papers documenting the physics goals and options of future colliders, and the reach of the related experiments will be released to the particle physics community. A pre-Conceptual Design Report on the Circular Electron-Positron Collider and the Super Proton-Proton Collider will be completed by early February. Many participants of this program, including a group from HKUST, will contribute to its write-up.

IAS Symposium on Activated Sludge - Past and Next 100 Years



Wastewater treatment has been practiced for a century in which the activated sludge technology plays the major role of protecting the water environment and offering an alternative water resource for reuse and recycle. With the growing concern around climate change, and given the increase in global population, and fast urbanization in emerging countries and particularly countries in Asia, new ideas, concepts and approaches to wastewater management are essential for global sustainable development. These new ideas, concepts and approaches to wastewater management must be directed towards energy, water and resources recovery, and space saving.



As one of the four global centennial celebration events for the birth of activated sludge in 1914, the symposium on "Activated Sludge - Past and Next 100 Years" was held at IAS on 26-28

August 2014 in collaboration with the International Water Association, Drainage Services Department of the HKSAR

Government, Sun Yat-sen University, Taiwan and many other supporting bodies in Hong Kong and the region including Singapore's Public Utilities Board and Japan Sewage Works Agency. Led by Prof Guang-Hao Chen, Professor of Civil and Environmental Engineering of HKUST, the 3-day symposium featured 18 leading experts to review the past developments on activated sludge-based technologies and share their thoughts and experiences in developing future systems and technologies for the region, and for the world. The symposium attracted around 130 attendees.

IAS Symposium on LIGHT SCIENCE AND ITS APPLICATIONS



Year 2015 is proclaimed as the International Year of Light and Light-based Technologies by the 68th Session of the United Nations General Assembly. Over the years, light has been playing a vital role in our daily lives, not only for illumination but also widely applied in communications and medicine. On 24 November 2014, a symposium entitled "Light Science and Its Applications" was held at IAS as a pre-celebration of the Year of Light. Experts on optics were invited to share their findings and visions on the development of optical materials and optical engineering.



The symposium was kicked off with two seminars delivered by IAS Visiting Professors Marvin Cohen and Yuen-Ron Shen from the University of California at Berkeley. The importance of optics in understanding the electronic structure and laser spectroscopy of materials was discussed. The latter half of the symposium concentrated on the new advances in light based science and technology. Local experts from HKUST, the Chinese University of Hong Kong and Hong Kong Baptist University revealed the recent applications of light in electronic engineering, biotechnology and microscopy.



► The 22nd Annual Conference of Hong Kong Institution of Science



2014 Young Scientist Awards were presented to awardees.



(From left to right) President Tony F. Chan, Mr David Foster of Croucher Foundation and The Honorable Mrs Fanny Law, GBS, JP of Hong Kong Science and Technology Parks Corporation held a panel discussion on "Future of Science and Technology in Hong Kong".



► UC RUSAL President's Forum



Mr Ronnie C. Chan (left), Chairman of Hang Lung Properties was the ninth speaker in the talk series.

For more details on IAS events,

► IAS Conference on Entrepreneurship and Finance



IAS Visiting Professor Alexander Ljungqvist, the keynote speaker of the conference, delivered a talk entitled "What if...the Stock Market Disappears".



The Gerhard Jirka Summer School was held at IAS in Dec 2014 and attracted over 50 participants from around the world.

► 2014 Gerhard Jirka Summer School on Environmental Fluid Mechanics: Modelling and Its Role in Sustainable Development





Call for Proposals

As a unique academic platform where great minds converge, IAS offers unparalleled opportunities for HKUST faculty members to bring in renowned scholars from around the world for various forms of academic activities:

- ▶ IAS Distinguished Lectures for distinguished scholars to give a lecture of general interests.
- ▶ IAS Joint School Lectures / Seminars for outstanding scholars to give a talk of a specific topic.
- ▶ IAS Programs comprising short courses, workshops, and in some cases postdoc-led / postgraduate student-led discussion sessions. Fully-fledged programs mostly take place during term break, while smaller-scale focused programs on particular topics are also organized during the term.
- ▶ IAS Visitors Programs (IAS Visiting Professors, IAS Senior Visiting Fellows and IAS Visiting Fellows) for prestigious scholars to make regular visits to IAS on collaborative projects with HKUST faculty members.
- ▶ Sponsorship of Plenary / Invited Speakers of Activities for faculty members to help IAS build clusters of research activities and new initiatives at HKUST in the form of standalone conferences, workshops, seminars, symposiums, etc.

Please browse our webpage at <http://ias.ust.hk/proposal> for further details, or contact our Director Prof Henry Tye and Executive Director Prof Che Ting Chan to discuss further (email: ias@ust.hk / tel: 2358 5968).



HKUST JOCKEY CLUB INSTITUTE for ADVANCED STUDY

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