

## Department Staff Retreat, 18 - 19 Jan 2013

On 18 to 19 Jan, 55 faculty staff gathered at Changi Village Hotel for a one-and-a-half day staff retreat. The objectives of the retreat, as Prof Feng communicated in his opening speech, were to understand the strengths and weaknesses of the department, formulate goals for the near future and identify strategies to reach there.

Staff was divided into seven groups for discussion of existing policies and practices as well as recommendations for change pertaining to three areas: teaching, research and governance. A representative from each group then presented the group opinions to the plenum. A number of interesting questions and points were raised during the presentations which are really food for thought.

For teaching, a core issue of concern is improving on the existing curriculum for our physics undergraduates. A survey on physics majors does validate such a concern. In the area of research, of importance are the research quality and evaluation, strategic directions the department should be taking and graduate recruitment.

On governance/service, the issues of recruitment, space and infrastructure and non-academic support were discussed.

Many useful ideas were proposed during the retreat to improve on certain current practices to the benefit of our students and staff as well as for the future development of the department. In the comfort of the hotel facilities, discussions still carried on during the sumptuous meals. Away from the hustle and bustle of a busy campus, the retreat indeed also served as a chance for teambuilding among staff.



### ..... Inside this issue :

An Interview with A/P Chen .	2
Talk by Physical Review editors	2
Our Alumni Speak . . . . .	3
Physics in Action! . . . . .	4
Two new GEK modules. . . .	4
Discovering Physics . . . . .	5
Staff Outing . . . . .	6
Physics Safety Day . . . . .	6
A Day in the Life of . . . . .	6
Frankly Speaking ... . . . .	7
Awards . . . . .	8
Announcements . . . . .	8

THE EDITORIAL COMMITTEE  
WISHES ALL STAFF AND STUDENTS A  
REWARDING AND CHEERFUL 2013!



Department of Physics





## An Interview with Asst/P Chen Wei

Asst/P Chen Wei from the Physics Department received the prestigious Young Scientist Award 2012 for his research on interface engineering for molecular, organic and graphene electronics. The Young Scientist Awards recognise young researchers, aged 35 years and below, who are actively engaged in R&D in Singapore, and who have shown great potential to be world-class researchers in their fields of expertise. *Physics Matters* has the privilege to hear from Asst/P Chen Wei regarding his research.

### What kinders your interest in pursuing scientific research?

I really became interested in science and research when I got in touch with scanning tunnelling microscopy in NUS in 2001. For the first time, I could see one single atom and move the atom! That was so fantastic! So I decided to work with science and research in my whole life. In the past ten years and more, I have been working on molecular electronics dealing with single atom and single molecule.

### Could you share a bit more about the research that got you the Young Scientist Award?

One of my aims for research is to use single molecule to build the smallest molecular electronic devices, such as transistors, sensors, data storage devices, and so on. In this particular contribution leading to the award, we demonstrated the feasibility of using single dipole molecule to store information. If we can realise such data storage device, we can actually achieve an ultrahigh data storage density of up to 300 TB/inch<sup>2</sup>, which is about 100 times higher than what the current data storage device can store.

### How do you overcome any tough challenge(s) you face along the way?

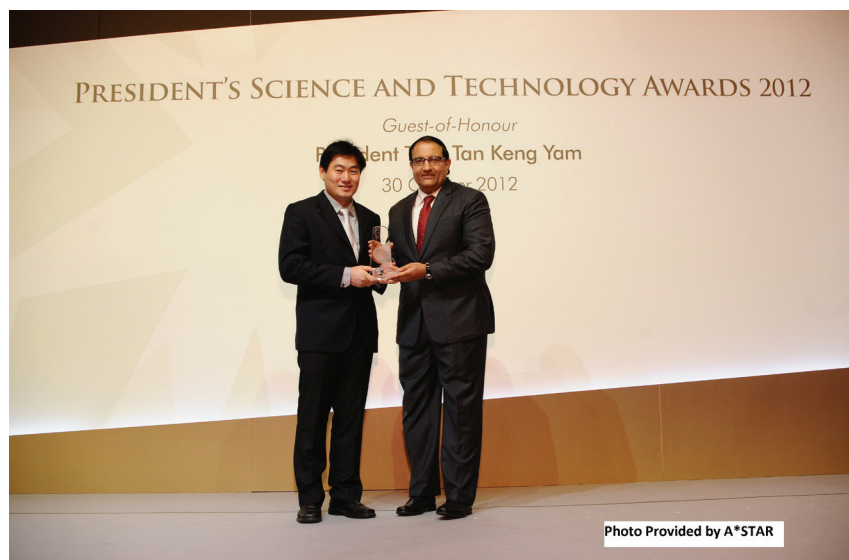
In pursuing research we have to deal with scientific challenges every day. This is actually the most enjoyable and exciting part of doing research! Here are some simple strategies I feel very powerful in dealing with challenges:

Do believe that there are always many ways to overcome a tough challenge, and your task is to find out a best way during this period; No one can solve the problem for you; you have to do it and cannot simply wait;

Do try your best to look for necessary help from your friends and colleagues.

### Do you have any advice for budding scientists?

We always say "research is our life". We do research because it is our interest and we enjoy doing research. We also have to make sure that we can have a good work-life balance when doing research.



↑ Asst/P Chen Wei receiving his award from Mr S Iswaran, Second Minister for Trade & Industry

## Talk by Physical Review Editors, 8 Oct

Two editors of the Physical Review journals visited the department on 8 and 9 Oct and presented a talk. They are Dr Ling Miao, associate editor of Physical Review X (PRX), and Dr Manolis Antonoyiannakis, editor of Physical Review Letters (PRL). The Physical Review family journals (PRL, PRA, PRB, PRC, PRD and PRE) are the bedrock journals of the American Physical Society (APS) and need the support and contribution from the international physics community to maintain their strengths.

The talk focused on the status of the Physical Review journals and their multifaceted contribution to physics and physicists. Dr Manolis Antonoyiannakis presented the editorial process and provided an insider's view of the APS editorial system: from selecting good papers to be published to rejecting papers that are obvious marginal advances. He also touched on the process of choosing suitable referees for the submitted manuscripts.



Department staff had a chance to hear firsthand how they could maximize their chances of publishing in the APS journals and contributing their scientific expertise and views by being a journal referee. Representative statistics on publications, citations and impact measures, and some geographic and institutional comparisons were highlighted during the talk.

Dr Ling Miao also gave an overview of the advantages of publishing in PRX, an open access journal which enjoys a high profile like PRL. It accepts contributions from all areas of physics, there is no page limit and multimedia components of the research paper can be added. More details can be found in <http://prx.aps.org>.

The editors welcome any feedback on the APS journals and hope their talk would ignite the physics community here to collaborate actively to bring out more excellent journals.

## Our Alumni Speak ...

Alumni Ng Jiatong (BSc Physics, Hons, 2006) and Xie Yilin (MSc Physics, 2010) share with *Physics Matters* how physics has played a role in their current undertaking.

"I decided to take up Physics in university because I enjoyed this subject very much when I was in a junior college. I find it amazing that many of the phenomena in our daily life can be explained by Physics using simple yet elegant equations. Although higher level university Physics becomes more abstract, the underlying spirit of it is still using a mathematical



↑ Mr Ng Jiatong, Class of 2006

framework to explain physical behaviour albeit in dimensions no longer visible to the human eye. I wanted a very theoretical understanding of Physics and NUS did provide me with the avenue to pursue this aspect of it, especially with the presence of knowledgeable professors to guide me.

I am currently working as a commodities trader. My role is to buy and sell assets (in my case agricultural commodities) on behalf of my company. The challenge is to maximize profits based on the capital and limits entrusted to me. In my job, I deal a lot with numbers and often need to make decisions within a short amount of time and without complete information, ie I have to make accurate assumptions from various sources. For instance, by deciding to buy a unit of soybean at a certain price, I have to make assumptions about the weather, potential increase in consumer demand, etc, all of which are factors which will determine whether the soybean I bought will increase in price or not, and hence generating a profit for my company.

Making such informed assumptions is also part of solving problems in Physics as very often you do not have a complete set of information and therefore you need to make certain physical and mathematical assumptions to solve the problem. A Physics education is very mathematically rigorous and very often it prepares students well for a career such as trading which demands analytical problem solving and the ability to think logically with the help of equations to formulate problems.

I think one of the most important contributions of my Physics education is the inculcation of a culture where one can engage with peers in intellectual discussions. Also the problem-solving emphasis of the course prepares me well for real-life problem solving. I miss the small classes of the Physics cohort where lectures and tutorials were held in quite an interactive style. I also miss the friendly competitiveness amongst the students."

Ng Jiatong

"Currently I am working in the Data Storage Institute, A-Star, as a Research Engineer. My daily work involves performing text analytics on patent publications. From time to time, the management or researchers require my service to conduct patent analytics where the results would assist with their decision-making and research work. Another key aspect of my work involves gathering the latest news and information that are relevant to DSI's key research areas. The news is then disseminated to the staff through various means such as email and our news portal.

My physics education helps me to see problems in a more fundamental perspective. Although I am primarily working on patents, much of my work still requires me to keep in touch with what the researchers are working on and the physics training I had is really helpful. However this is only in terms of knowledge.

I feel that what really shaped my working attitude is the time I spent in the research laboratory while working on my Master's thesis. I would like to take this opportunity to thank my mentor A/Prof Sow for all his guidance while I was his student. He had given me a lot of freedom to explore and learn. Looking back, I think that the education I got is not so much from the experimental results I had obtained, but rather the entire learning process made me understand this: life, like physics, has many mysteries and in the process to discover them, we are faced with many ups and downs. And we really need to learn to motivate ourselves when we are faced with a series of setbacks.

As a student, I had opportunities to make mistakes and learn. Unfortunately, life outside campus is not so kind. Whatever the situation, we still need to continue to learn and grow in both mind and spirit.

I miss my classmates and the amount of free time I had in my undergraduate days. I miss 'mugging' for exams and camping inside the tutorial rooms during exam periods together with my classmates. As a student, I enjoy all the free time to do reading and gaming, but now I have more job and family responsibilities."

Xie Yilin



⇐ Mr Xie Yilin, Class of 2010



## Physics in Action!

Asst/P Tan Meng Chwan, one of the recipients of the Faculty Teaching Excellence Award 2012, shares with *Physics Matters* his teaching experience so far in the department.

I started teaching in Semester 2 of AY10/11. I have since taught PC1221 and PC1431, and I'm currently teaching PC1432. PC1221 is for students who do not have A-level Physics but who nevertheless have an interest in courses which require a background in A-level Physics. PC1431 and PC1432 are "Physics for Engineers" courses on Mechanics/Thermodynamics and Electrostatics/Electrodynamics/Quantum Physics, respectively.

I was first trained as an electrical engineer, not a physicist. As such, I probably have a good a priori understanding of the problems non-physics students – especially engineering students – face when it comes to learning fundamental physics. That certainly helps in making the courses I taught a success.

In particular, engineering students are more often than not concerned with the application of the laws of physics rather than how the laws themselves were formulated. This is especially true of those who come from the polytechnics. How I motivate them to be interested in the formulation of the laws is to ask them this very simple question at the start of every course: do you want to be a worker or an inventor? I then go on to explain that if an engineer wishes to invent something, he/she would need to first understand how the laws behind the relevant physical phenomena arise. Once they see this rationale, they would immediately appreciate the significance of why they should study the laws beyond their pure application.



↑ Asst/P Tan Meng Chwan (right) receiving his award from Prof Lai Choy Heng

That being said, this rationale alone is not enough to sustain their interest, especially since there are also non-engineering students in PC1221. So what I would do is to also tell them a little bit about cutting-edge theories in physics such as String Theory, which aims to answer the biggest questions posed by mankind since the dawn of time like how our universe began, how it would end, whether time travel is possible or not, etc.

Of course, I also make an extra effort to connect what is being taught in class with reality. Physical intuition is developed from our day-to-day experiences of physical phenomena. For example, everyone who has ever been in a vehicle knows that we go forward when the vehicle brakes, or that when the vehicle turns left, we swerve right, and vice-

versa. From this, we grasp the principle of inertia, that we tend to follow our original trajectory whenever a force acts upon the frame in which we are in. By relating the laws to some real-life examples, I not only arouse the amazement and interest of the students, but also sharpen their physical intuition and ability to draw conclusions from a novel perspective.

Last but not least, I also make it a point to break down the traditional barrier between teacher and student. I do this by employing an open-door policy. I encourage students to ask me anything, regardless of whether it is related to the course or not. This way, they would feel more comfortable with me, and in my experience, they actually end up asking more about what is being taught in class.

## Two new GEK modules launched by department

### GEK1547 The Art of Science, The Science of Art

It often seems the worlds of science and art are unrelated: logical truth versus emotional imagination. Still, science and art have much in common. Science has caused paradigm shifts in artistic expression and art is used for engineering design and communication of scientific knowledge.

GEK1547 will introduce students to the use of materials and technology related to architecture, sculpture, painting, photography, imaging, etc; of colour, light and perspective to create a 3-dimensional illusion; of technology for dating and attribution of objects of art; and finally, of visual art for scientific illustration and design.

Knowledge of the scientific principles of various forms of visual art will be explored. The module also aims at the development of some artistic skills for illustrations of scientific concepts and engineering designs.

### GEK1548 How the Ocean Works

Seventy-one percent of Earth's surface is covered by water! This has had a profound effect on how our species have progressed and will continue to influence how our future is shaped. The recent disastrous effects of tsunamis and hurricanes, coupled with concerns about global warming, climate change and carbon recycling have made it important to understand more about how the oceans work on a global scale.

GEK1548 will introduce students to the various phenomena related to the oceans, how the oceans affect our lives, our attempts at understanding the workings of the oceans using exploration and the scientific theories developed, and our attempts at controlling and exploiting the oceans.

Students will appreciate the scientific principles involved with minimal mathematics. This course also prepares students to better understand the role of oceans, and provide insight into making educated decisions regarding our vulnerable environment and our precious supply of water.

# Discovering Physics - Quantized Acceleration and Long-Lasting Quantum Exponential Spreading

What can be counted as a discovery in pure physics? I am not sure. To expose what nature can do in principle is my aspiration as a physicist. My research group in the Physics Department at NUS has been working on deceptively simple models to better understand some exotic aspects of quantum dynamical evolution.

Here I describe two surprising findings from our recent research, namely, “quantized acceleration” and “long-lasting quantum exponential spreading”. They are two unrelated pieces of physics, but were found in similar dynamical models.

## Quantized acceleration

In both classical mechanics and quantum mechanics, position and momentum variables can be treated on an equal footing from a phase space perspective. However, the actual physical world does not have position-momentum symmetry. For example, the energy band of a solid is formed because the electronic Hamiltonian is periodic in position, but not in momentum. Understandably then, we have much knowledge in quantum transport in position space, but not much so in momentum space.

My PhD student Derek Y H Ho and I studied a class of non-relativistic quantum systems periodically driven by instantaneous control pulses. The wide spectrum of the control pulses induces a periodicity in momentum space. Loosely speaking, this realizes a “momentum crystal”. It is found that the quantum mean acceleration is closely connected with the topology of the so-called Floquet quasi-energy bands.

By adiabatically varying an experimentally tunable parameter over one periodic cycle, we showed that the mean acceleration of our model system prepared on momentum-space Wannier states is *quantized*: it is proportional to the topological “Chern” integers of a Floquet band.

This finding shall stimulate more interests in momentum-space transport as well as topological phase transitions in driven quantum systems.

## Long-lasting quantum exponential spreading

Is exponential growth in the expectation value of quantum observables possible for a long time scale? The answer would be a trivial yes if I were to have an upside-down potential. Exponential sensitivity inherent to chaos sounds like an intuitive and nontrivial solution, but this alternative is not really applicable because chaos is a classical mechanics concept and it does not make much sense in the time evolution of small quantum systems.

My collaborators and I recently showed how to achieve long-lasting exponential spreading in momentum space via driving fields. The underlying physics is as follows.

First, without pushing a quantum system close to its true physical classical limit, a quantum system in its deep quantum regime is tuned close to a type of quantum resonance with a chain of instantaneous control pulses. Remarkably, the dynamics of the close-to-resonance quantum system then behaves extremely close to a pseudo-classical system.

Second, we design a driving protocol such that the pseudo-classical system has one unstable fixed point and that the initial quantum state can be placed almost perfectly astride the stable manifold of the pseudo-classical unstable fixed point.

As time evolves, the quantum ensemble is attracted to the unstable fixed point and then exponentially repelled from the fixed point along its unstable manifold. Depending on the detuning from the resonance, the time scale of this exponential behavior can be made arbitrarily long. Such a possibility of long-lasting exponential spreading in driven quantum systems represents one novel aspect of quantum evolution. Is it useful? Perhaps it is too early to speculate on that.

## References

Ho D Y and Gong J B, “Quantized adiabatic transport in momentum space”, *Phys Rev Lett* **109**, 010601 (2012) (*Editor's Suggestion*)

Wang J, Guarneri I, Casati G and Gong J B, “Long-lasting exponential spreading in periodically driven quantum systems”, *Phys Rev Lett* **107**, 234104 (2011)

A/Prof Gong Jiangbin's main research areas are quantum dynamics control, nonlinear dynamics, as well as open quantum systems. He obtained his PhD in theoretical chemical physics from the University of Toronto in 2001. After postdoctoral studies at the University of Toronto and the University of Chicago, he joined NUS in 2006 as an Assistant Professor. Currently, A/Prof Gong is an Associate Professor with a Dean's Chair Professorship.



↑ A/Prof Gong Jiangbin, Dean's Chair Professorship recipient



## Staff Outing, 3 Jan



On 3 Jan, about 60 staff came together to enjoy a fun-filled afternoon at Westwood Bowl. With 14 bowling alleys, most staff were able to bowl for almost 2 1/2 hours with attractive prizes awaiting the teams and individuals with top scores at the end.

Special thanks go to the Welfare Committee who had organised the outing. Members of the Welfare Committee hoped staff had a great time of unwinding and camaraderie during the game. The committee also looks forward to planning the next event and hopes there will be equally enthusiastic response.

## Physics Safety Day, 26 Sep

The 3rd Physics Department Safety Day was held on 26 Sep 2012 and attracted more than 100 participants. Through this annual event, the Physics Safety Committee hopes to raise the importance of safety and wellness issues on a departmental, laboratory as well as individual level.

It was also a day to show appreciation to students and staff for keeping an eye on safety all year through. Besides door gifts, a fun quiz, lucky draws and a sumptuous buffet, two talks were presented: A safety talk on "Handle yourself with care: Practising good ergonomics in the office and the laboratory" and a health talk on "30 health tips".

Indeed it was a happy and safe day for all.



## A Day in the Life of...

"I am a volunteer nature guide for Singapore National Parks, so I spend my weekend in nature parks and forests sharing my interest on nature with the public. I also practise taiji and even qualify to be an instructor. Presently I am learning a very ancient Chinese Hokkien music called Nanyin although I have totally no singing or musical experience." A proud Mr Lim Teck Seng shared about his favourite hobbies when approached by *Physics Matters*.

Another familiar face in the Physics Department, Mr Lim Teck Seng has been a lab technologist for over 30 years. He is the department's in-house estate manager whom everyone will turn to when the lift breaks down or the air-conditioning does not work.

Mr Lim's main responsibilities are laboratory and building management and technical support. He has to co-ordinate any major building maintenance or renovation works within the department as well as with other departments or external contractors. Attending meetings is an important part of his job in order to be updated with happenings. He also has to look into the day-to-day problems regarding lab equipment, locks, air-conditioning and telephone system. Keeping staff and students informed about any ongoing maintenance or related works is something he does faithfully. He provides support to the Electronics Support Unit and the Observatory too.

Mr Lim likens colleagues to family as they share their problems and solutions and offer assistance to one another. His greatest job

satisfaction is to be able to offer technical advice and suggestions to staff and students such as any in-house improvisations with help from the department workshop instead of paying vendors to do the same job.

Being fond of our own Singlish, Mr Lim said he could relate very well with his ancestral Hokkien roots in a Singlish culture. He has visited his ancestral birth place in Quanzhou, Fujian, China, and looks forward to visiting it again.



↑ A happy Mr Lim in one of his overseas trips



## Frankly Speaking ...

Prof Frank Watt, Professorial Fellow and former Director of CIBA, shares his insight and thoughts with *Physics Matters*

### You had a tenured position as a research lecturer and head of the Scanning Proton Microprobe Centre at Oxford University, so what made you decide to come to Singapore?

I was given the chance to visit NUS in 1990 under a visiting fellowship scheme operated by the International Atomic Energy Agency (IAEA) in Vienna. During that two-month visit to the Physics Department to work with the former dept head, Prof S M Tang, I realized that there was a high potential within NUS for carrying out interdisciplinary research (one of my research interests in Oxford was applying nuclear-physics based techniques to biomedical problems). I subsequently took a one-year sabbatical leave from Oxford, during which time we built up a proton microscope similar to one we had designed and built in Oxford. I managed to get another three years absence of leave from Oxford, and took a further three-year contract in Singapore – during this time it became clear to me that NUS was far more interested in multidisciplinary research than the Dept of Nuclear Physics in Oxford. I therefore gave up my tenured position in Oxford to make my stay in Singapore more permanent; of course this decision was encouraged by my wife and son, who love living in Singapore.

### What do you think was the research highlight of your career?

In the late 1980s/early 1990s, many medical research groups around the world believed that they had demonstrated that aluminium was the probable cause of Alzheimer's disease, a terrible degenerative brain disease affecting around 25% of the population over 80. As you can imagine, this had a disastrous effect on the aluminium industry. While in Oxford, I managed to obtain a large grant from one of the leading medical foundations in the UK (the Wellcome Trust) to investigate how aluminium caused Alzheimer's disease. Our Proton Microscope at Oxford could map aluminium in the brain. To cut a long story short, we subsequently demonstrated that aluminium was not the cause of Alzheimer's disease. Our research was subsequently published in the journal *Nature*, and this not only changed the direction of Alzheimer's research, but resulted in a huge turnaround in fortunes for the aluminium industry. Interestingly this was a prime case of us failing in our proposed research objective, yet achieving significant scientific notoriety. Was the funding agency impressed that we did not succeed in our objectives? The answer was a resounding YES! There is a moral to this story somewhere...?

### What qualities do you think make a good researcher?

Undoubtedly you got to have an enthusiasm for research. It is not enough to have a good grounding in your chosen subject; you also need to have abundant curiosity, imagination and an open mind. You also have to be resilient: All good researchers are able to bounce back when they have setbacks; if you are frightened of failure, then research is not the career

for you. Failure has many facets, from having what you think is a good research proposal turned down, to finding out that the research line you are pursuing does not work. I am constantly surprised when research funding agencies ask detailed questions on what the outcome of your research will be: If you know in advance what your research will discover, then maybe this is not true research?

### Any words of encouragement for our physics students?

Physics is a fantastic subject where the emphasis is on understanding phenomena at a deep level. I think it is true to say that if you have a physics education then you can branch out later into almost any subject area because of the mindset developed during your training. For example, I see many physicists making inroads into medical research, but not vice versa. Indeed, at least two of our physics graduate students are now working in the National Cancer Centre in the Singapore General Hospital. Physics graduates are not only in great demand for their flexibility but for their ability to solve problems too. Problem-solving skills should never be underestimated: Physicists intrinsically have skills which enable them to approach problems from a fundamental level.

### Share with us your hobbies.

I have lots of hobbies, most of which are sports orientated, although these days I am more involved in watching than playing! I also like travelling, and one of my favourite pastimes is visiting old buildings. The cathedrals and castles of Europe are fascinating, and one of the major attractions of living in the far east is the many temple complexes such as Angkor Wat in Cambodia, Borobudur and Prambanan in Java, and the many temple complexes of China and Japan. I feel privileged to have visited these places. Interestingly, on a recent trip to Xi'an to visit the world famous terracotta warriors, I became very aware that my distant ancestors could well have been Chinese – I was amazed to see that one of the terracotta warriors looked remarkably like me!



↑ One of the terracotta warriors "looked like" Prof Frank Watt!

## Awards

### National Day Long Service Award 2012

Prof Lai Choy Heng

### Singapore Young Scientist Award 2012

Asst/P Chen Wei

### SMP Outstanding Mentor Award 2012

Dr M V Venkatasamy Reddy

### Faculty Teaching Excellence Award AY2011/2012

A/Prof Chung Keng Yeow

A/Prof Lim Hock Siah

Dr Chammika N B Udagama

Dr Tan Meng Chwan

Dr Wang Qinghai

Mr Hong Chong Ming, Kenneth

### Teaching Assistant (Full-time) Award AY2011/2012

Dr Ng Wei Khim

Mr Lim Yen Kheng

Ms Qiu Leiju

Ms Tao Ye

### Outstanding Scientist Award 2012

Prof Valerio Scarani

### Young Scientist Award 2012

Dr Barbaros Özyilmaz

### Outstanding Service Award 2012

Mr Abu Mansor Bin Haji Na'Man

Mr Cheong Mun Yin

Mr Foong Chee Kong

Ms Goh Bee Hwee

Mr Lim Hwa Ngee

Ms Tan Teng Jar

Ms Zhou Weiqian

### Commendation Award 2012

Mr Mani Mohan s/o Subhas Balan

Mr Muthusamy s/o Annanvy

### NUS Quality Service Award 2012: Service Advocate

Ms Zhou Weiqian



*I never expect that I can win this award. I am very honoured and this will be my motivation to continue working hard and provide better service in future.*

*Zhou Weiqian, Outstanding Service Award*



*I always enjoy teaching. This award encourages and motivates me to continue in this path of ACTION. I would like to share this award with the lecturers, TAs and LOs that I have worked with. Lastly, I would also like to thank the students for their timely feedback to help me improve my teaching methodology.*

*Ng Wei Khim, Teaching Assistant Award*



*I'm really excited to receive a teaching award for the first time. It's a recognition of my effort but the honour also goes to all the colleagues of the engineering physics team for their guidance and help. Thanks should go to my students too for their support.*

*Tao Ye, Teaching Assistant Award*



*It is a pleasure and honour for me to receive this award which is also an acknowledgement of the accomplishments of my colleagues whom I am thankful to. I enjoy the good relationship I have with staff and students. Helping with their projects which turn successful in the end is especially rewarding to me.*

*Abu Mansor, Outstanding Service Award*

*It is a great honour for me to receive this award. I would like to share the credit with my fellow colleagues whom I work with and thank them for their continuous support. I regard the award as an encouragement to keep me going on with enthusiasm.*

*Cheong Mun Yin, Outstanding Service Award*



## Announcements

### 6th India-Singapore Joint Physics Symposium

25-27 February

Indian Institute of Technology (IIT), Kharagpur, India

More info at: <http://www.phy.iitkgp.ernet.in/isjps2013/>

### IPS Meeting 2013

4-6 March

School of Physical and Mathematical Sciences, NTU

More info at: <http://ipsmeeting.org>

### Friday Star Gazing

1 February, 15 March, 5 April

Contact: A/P Phil Chan,

Email: [phycabp@nus.edu.sg](mailto:phycabp@nus.edu.sg)

### Punggai (Johor) Star Gazing Trips

22 February, 8 March, 12 April

Contact: A/P Phil Chan,

Email: [phycabp@nus.edu.sg](mailto:phycabp@nus.edu.sg)

### Germany Immersion Trip 2013

9-30 June (tentative)

Contact: A/Prof Thomas Osipowicz,

Email: [phyto@nus.edu.sg](mailto:phyto@nus.edu.sg)