OmniSCI
An online publication for NUS Science students and alumni

NUS National University of Singapore | Faculty of Science

Students

Saving sea turtles

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Off to a good start

Academic Year 2012/2013 freshmen get set for their campus life with knowledge gathered from Dean's Welcome Tea.

Carnival of an Open House

Potential students and their parents experience a vibrant campus when they checked out the Faculty of Science Open House.

Prime

Boosting graphene research

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Now or never

A rare occurrence that is the last one of this century, the Transit of Venus, is celebrated university-wide by the Faculty of Science.

Alumni/Friends

One chapter ends, another begins

A total of 1,627 newly minted alumni from the Faculty of Science embrace a new future following their graduation at Commencement 2012.

For a good cause

Donors doing their bit for Faculty of Science and its needy students.

Way to go!

Class of 2012 alumnae, New Jin Rou and Chen KangTing, Yvonne, have earned more than a Science degree; their training is taking them places.

STUDENT *Writers* WANTED!

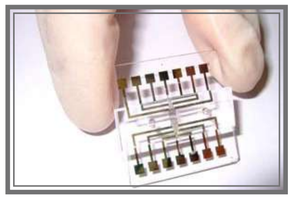
What's Up...

Check out the events held from October 2012 to February 2013!

Research

Cancer cells: Arresting their growth?

Department of Biological Sciences researchers have found a way to arrest cancer cell growth through energy 'starvation'.



Malaria detection: Now faster and better

Professor Loh Kian Ping and team have fabricated a newly improved malaria detector using graphene.

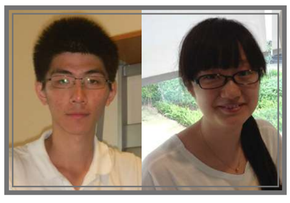
Chemotherapy triggers cognitive changes

A first of its kind qualitative study led by Associate Professor Alexandre Chan suggests that Asian breast cancer patients experience cognitive deterioration following their chemotherapy treatment.

Department

International Biology Olympiad

Singapore plays host for the first time in this sporting event, which saw its students scoring its best results ever – four gold medals and an overall top gold.



Model victory

Department of Mathematics students win in the Outstanding Winner category for the first time, at the international Mathematics Contest in Modeling, bagging the Ben Fusaro Award.

Together, we remember

The Dean's Office and Department of Chemistry mark the first anniversary of the passing of Professor (Mrs) Tan Sau Fun with a memorial gathering.

Adopting alternatives

The inaugural Biofuel 2012 sees participants congregate to discuss alternative aviation fuels and algae-based bioenergy.

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PRIME

Boosting Graphene Research

Singapore and NUS will see a boost in graphene research with the opening of the S$15 million Micro and Nano-Fabrication Facility at the University's Graphene Research Centre.

New set-up: *NUS President Prof Tan Chorh Chuan (in blue) with Prof Andrew Wee (right), Dean of the NUS Faculty of Science, working with graphene materials in the newly inaugurated Micro and Nano-Fabrication Facility.*

The first of its kind nano-science and nano-technology facility in Asia dedicated to graphene, this new state-of-the-art research set-up, will benefit researchers, faculty members and students alike.

Assistant Professor Barbaros Özyilmaz, for instance, will see his study where graphene provides a biocompatible scaffold that accelerates specific differentiation of stem cells into bone cells, being ramped up for biomedical applications, thanks to the new facility. Asst Prof Özyilmaz is a researcher with the Graphene Research Centre and the Department of Physics.

The new Micro and Nano-Fabrication Facility was inaugurated on 12 June 2012, at a ceremony graced by NUS President Professor Tan Chorh Chuan.

Leading in expertise

Of the new facility, Prof Tan said: "Graphene is one of the most interesting and promising materials of our time, although its unique properties have yet to be fully explored. NUS already has substantial strengths in this field and the establishment of the Graphene Research Centre will provide state-of-the-art facilities and expertise to advance our work and develop new applications.

We look forward to seeing novel discoveries and innovative breakthroughs emerge from the Centre, putting Singapore in the forefront of research in revolutionary new materials."

Adding, Prof Tan said: "I am certain that the new facility will become a major site for graphene research and application for the region and the world."

The Graphene Research Centre and its facility are involved in projects totalling over S$100 million. It aims to be a world leader in the emerging field of graphene research.

A Centre of the NUS Faculty of Science, it was set up under scientific advising by Professor Andre Geim and Professor Konstantin Novoselov, from Manchester University in UK and winners of the 2010 Nobel Prize in Physics for the discovery of graphene.

Brilliant prospects

Graphene, an allotrope of carbon, has great potential for use in various applications such as the development of new substrates for cell growth in medical applications and high-speed processors for a new class of ultra-thin, flexible computers. It can also be used in the display, lighting touch panel and photovoltaic industries.

Elaborating on its prospects, Professor Antonio H. Castro Neto, who helms the Centre, said: "The Graphene Research Centre aims to break current technological bottlenecks for industry adoption by meeting the industrial benchmarks of conductivity and optical transparency for graphene and by improving size and conductivity of graphene flakes from solution at a low cost.

Our long-term goal is to create a strong patent portfolio that will allow for start-up spin-offs and for commercialisation via the route of IP licensing to industry leaders."

A world leader in the area of graphene research, Prof Castro Neto is confident that promising devices would emerge from the new research facility soon.

More information is available at ***Graphene Research Centre***.

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PRIME

Now or never

A rare occurrence that is the last one of this century, the Transit of Venus, is celebrated university-wide by the Faculty of Science.

Celestial symphony: *Crowds at University Town, delighting in the unique 'Venus Transit Symphony' that combined cosmic sounds, orchestral music and moving images.*

The Faculty of Science (FoS) made it possible for many to marvel at an awe-inspiring, once-in-a-lifetime natural phenomenon of the Universe – Transit of Venus. It occurs when Venus, the Earth and the Sun are aligned, with the shadow of Venus cast against the Sun.

The rare transit sighted on 6 June is the last occurrence in the 21st century; the next transit will take place in 105 years' time in 2017.

Although here in Singapore, the transit occurred from sunrise to around noon, crowds gathered the evening before to prepare for the rare sighting.

Rare sighting

Astronomy enthusiasts, students, faculty and members of the public gathered at the NUS multi-purpose field to catch the rare transit of Venus.

Despite the morning drizzle and an overcast sky threatening to disrupt viewing, many stayed on. Their persistence paid off, for the sky cleared at around 11 am.

A steady flow of enthusiasts formed queues around the many telescopes that were strategically positioned to catch the last Venus transit of their lifetime.

A member of the public, Mr Han, who was present with his 10-year-old daughter, said: "It would be a waste if we didn't get to catch it due to the bad weather."

This unique event was made possible through the generous support from Singapore National Academy of Science (co-organiser of this event), Lee Foundation, Far East Organization Centre Pte Ltd, World Scientific Publishing Co. Pte Ltd and the Institute of Physics, Singapore.

Fringe activities

To commemorate the rare sighting, FoS organised a series of fringe activities across the campus from 5 to 6 June 2012.

As a prelude to the Venus transit, a novel cosmic concert held at Town Green@ University Town had the audience spellbound. The concert showcased 'Venus Transit Symphony', written and conducted by Dr Robert Casteels, a Visiting Fellow at FoS' Department of Physics.

Dr Casteels' composition combined celestial sounds captured live from outer space with a live band of 200 brass instruments being played. The live performance was accompanied by moving images of stars and a monologue on human strength and frailty produced by local playwright Huzir Sulaiman and delivered by actress Claire Wong.

FoS also organised public talks and a photo exhibition on 6 June morning, to raise awareness of astronomy.

While Emeritus Professor Roy Kerr, who flew all the way from New Zealand, shared his insights on the discovery of the Rotating Black Hole Theory, Professor Richard Strom, Visiting Professor and Astronomer at FoS' Department of Physics, offered a historical take on the Venus Transit.

Stargazers everywhere: *Enthusiasts gather at the NUS multi-purpose field to catch the rare Venus Transit.*

Renowned astro-photographer and NUS alumnus Mr Remus Chua showcased the celestial images he captured, drawing the attention of quite a number of public members, students and astronomical enthusiasts.

Summing up the two-day Transit of Venus @ NUS 2012 event that attracted about 2,000 in total, Chairman of the organising committee, Assoc Prof Chin Wee Shong, Vice-Dean of the Faculty of Science, noted that the event served as a great platform for cultivating interest in natural sciences among youths.

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STUDENTS

Saving sea turtles

Project Angel participants who are on a mission to save turtles in Hainan, China, find themselves on the shady side of turtle trade.

*Project Angel XIV is made possible with the sponsorship and support of The Lee Foundation, the Youth Expedition Project, the **Science Student Overseas Exchange Funds** and the National Youth Council, along with the efforts of all the participants.*

Proud 'parents': *Student Zenia Tiang (left) and Project Director Grace Choo (right), with their adopted sea turtles, affectionately named Angel and Linus. Alongside them is an intern working for the Sea Turtle 911 research facility at Haikou Normal University.*

Twenty six Faculty of Science students went undercover as secret agents to find out more about the illegal trade of turtle products in Hainan, China.

Pretending to be tourists, they went around touristy spots on the island and talked to vendors who are selling turtle products on the sly.

Their mission was part of Project Angel XIV, which focused on marine conservation this year, thanks to Project Director Grace Choo. Grace put forward the proposal of marine conservation, propelled as she was by the critical need of the environment and biodiversity for global conservation. Besides, she is an ardent fan of sea sports and loves the ocean, so wanting to protect it came naturally.

Demand and supply: *Such products made from Hawksbill Turtle shell, popular with many, further encourage commercial poachers.*

Survivor: *(Left) Nemo, the turtle that lost its front flipper now lives in the aquarium at Ritz Carlton Hotel Hainan.*

Suppressing trade

So what did these 'secret agents' find?

The students observed that even though the selling of turtle products has been made illegal, about 70 to 80 per cent of the vendors still carry turtle products such as jewelries. They even secretly sell them to tourists, mostly.

They also identified the 'hot spots' where the shady transactions take place, and what products are popular and their price range.

The team went on to share their findings with the students in the Sea Turtle research facility at Haikou Normal University.

Their findings will go towards efforts made to clamp down on the illegal trade on the island.

Nursing the sick

While on the mission, the students worked with Sea Turtles 911, a non-profit organisation dedicated to turtle conservation.

As part of their work, they had to commute by boat taxis daily to get to the Sea Turtle Hospital, which also acts as a research facility that facilitates the broadening of knowledge in sea turtle biology and conservation. The hospital houses some 20 to 30 sick or injured turtles.

The team nursed those ailing ones back to health by feeding them through syringes. They also helped to administer anti-fungal antibiotics and appetite-boosting injections.

Recuperated turtles would be released back into the water.

Still, there were some that would never be able to go back to their original habitat again despite the care given.

Explaining, Grace said: "We met Nemo, a turtle that lost a front flipper as a result of a sea accident. Turtles like Nemo deemed to be unable to survive on their own are not released back to the sea. Nemo now lives in an aquarium at the Ritz Carlton Hotel Hainan, reminding all who saw it on the importance of marine conservation."

Educating the young

The team also brought the conservation message to over 200 enthusiastic primary school children when they taught as visiting teachers at a local primary school. The teaching was another aspect of their project.

"It is certainly important to inculcate the value of conservation from young, rather than trying to change their habits in adulthood," stressed Grace.

On returning to Singapore, the team continued their conservation effort by sharing the need for environmental conservation with the students of Dunman High School.

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Saving sea turtles: *Students from Faculty of Science, on a noble mission to Hainan, China, as part of Project Angel.*

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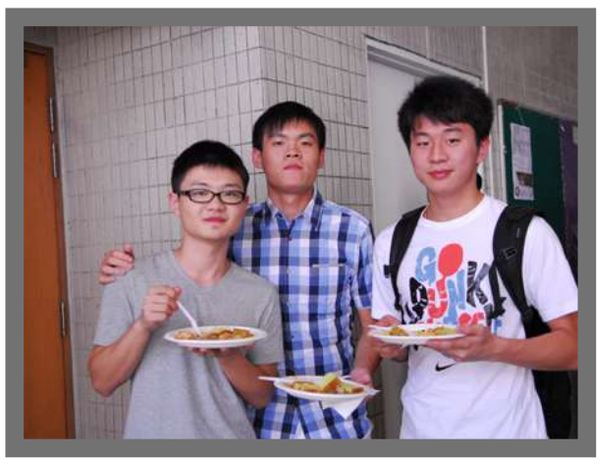
STUDENTS

Off to a good start

Academic Year 2012/2013 freshmen get set for their campus life with knowledge gathered from Dean's Welcome Tea.

Together, we strive! *(From left) Freshmen Ong Wei Yee and Jennifer Sim look forward to starting their undergraduate life at Faculty of Science.*



From China to NUS: *(From left) Yan Shi, Zhang Chi and Wang Rui attend the Dean's Welcome Tea to find out what the Faculty has to offer and to get to know fellow students.*

Full house: *Freshmen throng the lecture hall to listen to the talks on Centralised Online Registration System and Modular System, for an understanding of how they can apply for their modules.*

Jennifer Sim and Ong Wei Yee, formerly from Catholic Junior College, look forward to an enriching and rewarding student life at NUS. The duo, who will be pursuing their studies at the Faculty of Science (FoS), attended the Dean's Welcome Tea to find out what was in store for them.

Jennifer and Wei Yee were among close to 1,200 freshmen that attended the welcome tea, held at the Lim Seng Tjoe Lecture Theatre 27 on 24 July 2012.

Of initiation and discovery

All who attended the welcome tea were welcomed personally by Dean Professor Andrew Wee. Prof Wee encouraged the freshmen to discover their potential through the broad-based education offered by the Faculty.

He shared with them the career prospects of a Science graduate and provided an introduction to FoS, incorporating its numerous achievements.

Prof Wee also took the opportunity to introduce key faculty members, programme directors, as well as the respective heads of the Faculty's Biological Sciences, Chemistry, Mathematics, Pharmacy, Physics and Statistics & Applied Probability departments.

Throughout the welcome tea, the freshmen were treated to a line-up of talks on the courses offered by FoS, the majors that students can take and the modules they ought to sign up for.

In particular, they were briefed on the NUS Modular System by Associate Professor Chua Tin Chiu and navigated around the Centralised Online Registration System (CORS) by Dr Ng Kah Loon, Director of IT Unit.

International students from China, Yan Shi, Zhang Chi and Wang Rui, found the talks informative and useful, especially those that dealt with CORS and the special programmes.

"I am keen to be part of UROPS (Undergraduate Research Opportunities Programme in Science) so I can experience firsthand what it is like to carry out a scientific research," said the 19-year-old Yan Shi, a Ministry of Education scholar.

The freshmen were also treated to a video presented by the Faculty's main student body, the Science Club. The video gave them an idea of the extra-curricular activities they could take part in, for a balanced student life.

We wish the freshmen an enriching and rewarding time with FoS.

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STUDENTS

Carnival of an Open House

Potential students and their parents experience a vibrant campus when they checked out the Faculty of Science Open House.

Academic advising: *Prospective students, finding out about what the Faculty of Science has to offer, at the many booths set up for the Open House.*

Students about to decide on their choice of a university were treated to a carnival-like Faculty of Science Open House, where they spent half a day, soaking up the vibrancy of the Faculty.

From 9 am to 3 pm, they and their parents attended talks, went on tours, spoke with academic staff at the booths, checked out the student activities, and sampled the free lunch served for all.

Science discovered

To give perspective to the visiting students and their parents, Associate Professor Roger Tan, Vice Dean, Undergraduate Programmes, shared with them his talk entitled 'Discover Science – In Life, Sometimes You Can Have Everything'.

He highlighted that students could discover and maximise their potentials through the flexible curriculum and the multi-disciplinary approach of the courses and programmes offered by the Faculty. Students could also opt for a research path, if they so choose to, what with the Faculty's research foci and state-of-the-art facilities.

Academics from the respective departments of the Faculty – Biological Sciences, Chemistry, Mathematics, Pharmacy, Physics and Statistics and Applied Probability – gave an overview of the courses, majors and programmes available.

Students admitted to the Faculty could tailor the courses to best suit their interests and inclinations.

Professor Zhou Weibiao from the Food Science and Technology (FST) programme personally arranged for students interested in FST to tour the laboratory so they could see for themselves the research opportunities available.

Science Club and several student bodies had student guides bring the Open House visitors around the Faculty canteen, library, lecture theatres and tutorial rooms, as well as laboratories.

Just as personable were the interactions between potential students and the academic staff at the booths set up at the Faculty foyer. Students in need of counselling had their doubts resolved.

Career prospects

For the first time, the Faculty Open House invited three eminent alumni to share their success stories in a one-hour sharing session.

They were Regional Business Head of Nestle Nutrition (Asia-pacific region) Mrs Audrey Liow; Senior Producer and News Presenter of MediaCorp Ms Tung Soo Hua; and entrepreneur and Managing Director of Greenology Mr Veera Sekaran. These three Chemistry, Mathematics and Biological Sciences alumni have found their niches and did themselves and their alma mater proud with their success.

The alumni sharing session was facilitated by Associate Professor Chin Wee Shong, Vice-Dean, Outreach and Student Life.

As many as 1,000 potential students and their parents visited the Faculty of Science Open House, held on Saturday 19 May 2012.

Alumni sharing *: (From left) Senior Producer and News Presenter Ms Tung Soo Hua, Regional Business Head Mrs Audrey Liow and entrepreneur Mr Veera Sekaran take turns to talk about their successes. Facilitating is Assoc Prof Chin Wee Shong (in blue), Vice-Dean, Outreach & Students Life.*

Full house: *Prospective students listening in to Vice-Dean of Undergraduate Programmes, Assoc Prof Roger Tan, touching on 'Discover Science – In Life, Sometimes You Can Have Everything'.*

Dressed to thrill: *The Science Club students get into characters so as to promote a student camp to students enrolling at the Faculty.*

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ALUMNI/FRIENDS

One chapter ends, another begins

A total of 1,627 newly minted alumni from the Faculty of Science embrace a new future following their graduation at Commencement 2012.

Graduands Goh Daolin and Ho Choong Siang from the Department of Pharmacy, performing 'Here's to You' at their graduation ceremony, much to the delight of their peers.

Pharmacy graduands Goh Daolin and Ho Choong Siang got a chance to perform at their graduation ceremony, delivering the same song they sang when they were freshmen of the University, competing in Inaugural QuadFac Superstar. Closing a chapter of their undergraduate life with the very song they started it with, was certainly special for the duo.

Their song, 'Here's to You' by Brooke Fraser, was performed as part of Commencement 2012's newly introduced segment, celebrative items, held to make the graduation more memorable.

In addition to the song item performed by Daolin and Choong Siang at the Department of Pharmacy graduation ceremony, a video montage of photos of the graduating cohort and congratulatory messages, put together by the Department of Chemistry, was presented as well. The video was also well received by the graduands present at the graduation ceremony of the Department of Chemistry.

Commencement 2012 saw 1,248 undergraduate and 379 postgraduate students, being conferred their Bachelors degree and Masters or Doctor of Philosophy. There were four ceremonies, held on 10 and 11 July.

Valedictorians, Ouyang Fengcong John (left) and Dr Wong Lingkai (right), delivering their speeches.

Valedictorians, Valerie Ng (left) and Lau Tze Siong (right), addressing the audience.

Valedictorian, Dr Lai Chow Yin seated while awaiting his turn to deliver his speech.

Valedictorians, Nisha Bte Mohd Rafiq and Dr Wong Chui Ching, spotting wide smiles after receiving their degree scolls.

Motivation for the future

Graduands from the Biological Sciences, Chemistry, Mathematics, Pharmacy, Physics and the Statistics and Applied Probability departments, received their scrolls at their respective ceremonies.

They were treated to motivational speeches delivered by alumni who have made a mark for themselves in their chosen fields of expertise.

Among the Commencement guest speakers were:

• Dr Seet Ai Mee
(PhD Clinical Biochemistry, Class of 1969)
Justice of Peace, Singapore
Founder Chairman of Dover Park Hospice

Distinguished Science Alumni Award 2009 Recipient

Speaker, Dr Seet Ai Mee (left), with Faculty of Science Dean, Prof Andrew Wee (right).

Department of Chemistry Ceremony: Tuesday, 10 July, 3pm

• Mr Koe Khoon Poh
(Bachelor of Pharmacy, Class of 1966)
Managing Director
ICM Pharma Pte Ltd

Distinguished Science Alumni Award 2011 Recipient

Speaker, Mr Koe Khoon Poh, delivering his speech.

Department of Mathematics and Department of Pharmacy Ceremony: Tuesday, 10 July, 8pm

• Emeritus Professor Hew Choy Leong
(Bachelor of Science, Class of 1963)
Department of Biological Sciences, NUS

Outstanding Science Alumni Award 2009 Recipient

Emeritus Professor Hew Choy Leong, delivering his speech.

Department of Biological Sciences Ceremony: Wednesday, 11 July, 10am

• Mr Koh Kok Khai
(MSc (Statistics), Class of 2000)
Deputy Director
Psychological Assessment and Research/ Pre-School Education (Designate), Ministry of Education

Speaker, Mr Koh Kok Khai addressing the graduands and their guests.

Department of Physics and Department of Statistics & Applied Probability Ceremony: Wednesday, 11 July, 3pm

Work, toil, reward

Dr Seet shared with the graduands how the hard work of both her grandparents and parents had made it possible for her as a woman, to thrive in the 1960s. Though the times of the graduands may be different, she stressed that some things stay the same – reward comes to those who work and toil and that in life, there really is no short cut to success.

Dr Seet peppered her speech with 'motherly' advice, drawing much laughter from the crowd. She implored the graduands such, "don't make the world worse" and "do marry and when you do, marry someone smarter than you".

Graduands at Commencement 2012 mingled after their respective scroll presentation ceremonies, took photos with faculty members, friends and family before departing to face a new chapter in their lives.

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ALUMNI/FRIENDS

For a good cause

Donors doing their bit for Faculty of Science and its needy students.

Generous gift: *Alumna Ms Saw Phaik Hwa (left), presenting a cheque to Faculty of Science, represented by Prof Andrew Wee, Dean.*

The Faculty of Science (FoS) is appreciative of the donations received from alumna Saw Phaik Hwa and Baxter Healthcare Healthcare (Asia) Pte Ltd.

Student Bursaries

Saw Phaik Hwa has made a major gift to the NUS Faculty of Science to fund bursaries to support needy students. Starting in 2014, the bursaries will be awarded to the deserving students in the Faculty of Science, of which, Saw Phaik Hwa is an Alumnus.

Saw Phaik Hwa presented a cheque of $75,000 (first half of her total gift of $150,000) to Professor Andrew Wee, Dean of Science. Prof Andrew Wee graciously acknowledged the gift and explained that this gift will be an encouragement to these students, in giving them hope and help to complete their education in NUS despite their family's financial situation. He believes that this gift will propel students to achieve academic excellence and hopefully, to continue in the cycle of giving and receiving.

When asked why she has given to her alma mater, she said that "My university experience is perhaps the most important stepping stone in my career. I hope to help some students realise a fulfilling career and change the lives of their family."

Phaik Hwa has a Bachelor of Science (Hons) in Biochemistry and has undergone an advance management programme at the University of Hawaii. In 2009, her contribution and leadership in her profession as well as service to the community were recognised by the Faculty of Science with the Outstanding Science Alumni Award.

Encouraging excellence

Baxter Healthcare (Asia) Pte Ltd came forward for the first time to give away the Baxter Academic Excellence Prize valued at $3,000 recognising exemplary academic performance of Year 1 to Year 3 Pharmacy students.

The prize will be given out to top three Pharmacy students over a period of five years. The donation pledge will be fulfilled by 2013.

Baxter has accorded the prize to the Faculty's Pharmacy students acknowledging NUS' contributions to the Singapore healthcare community.

Its Managing Director, Ms Linda Seah, said: "Baxter's diverse portfolio is focused on treatments that help save and sustain lives. For over 30 years, Baxter has supported and contributed to the development of healthcare needs in Singapore and the Baxter Academic Excellence Prize aims to recognise and develop talent to meet the healthcare needs of Singapore."

Baxter is a global, diversified healthcare company that applies a unique combination of expertise in medical devices, pharmaceuticals and biotechnology to research and in creating products that advance patient care worldwide. The company strives to provide new products, as well as training and education to meet the needs of current and future patients.

Common cause: *Managing Director Ms Linda Seah (4th from left), representing Baxter Healthcare (Asia) Pte Ltd, and Dean Professor Andrew Wee (next to her), representing Faculty of Science, jointly mark the setting up of the Baxter Academic Excellence Prize, to be given away to Pharmacy students.*

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Way to go!

Class of 2012 alumnae, New Jin Rou and Chen KangTing, Yvonne, have earned more than a Science degree; their training is taking them places.

Overseas opportunity: *Alumna New Jin Rou works as a UNICEF child mortality estimation consultant in New York City, USA.*

New Jin Rou, consultant in New York City

As a child mortality estimation consultant at the United Nations Children's Fund (UNICEF) headquarters based in the Big Apple, Jin Rou, 23, is in charge of generating child mortality estimates for countries worldwide.

A coveted job many would vie for, it got Jin Rou excited and rearing to go. After she received the UNICEF job offer, she packed her bags and flew to New York City in a matter of nine days.

How did she land the opportunity? "It was thanks to Assistant Professor Leontine Alkema, my Final Year Project (FYP) supervisor," affirmed Jin Rou, who graduated this July with a Statistics and Applied Probability major.

On learning that the job was relevant to her honours thesis as well as an independent study she did in Year 2, she applied for it immediately. The rest is history, as they say.

As part of her day-to-day tasks, Jin Rou gets to incorporate some of the results from her honours thesis into the methodology adopted in UNICEF's child mortality estimation. She conducts country consultation on child mortality estimates and is involved in preparing the child mortality report for this year. She is also involved in another UNICEF report to be published later in the year.

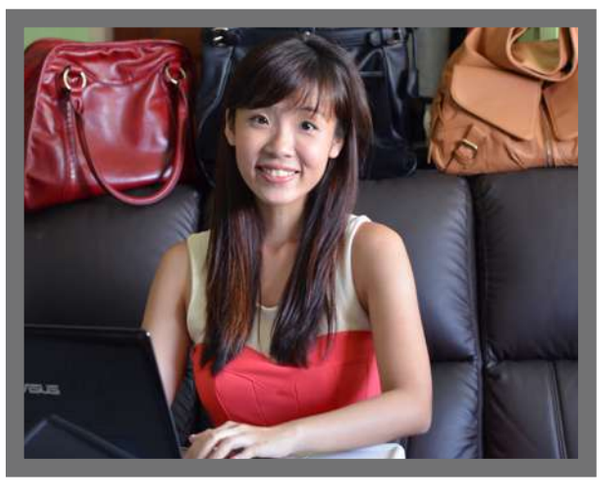
What is her greatest satisfaction working at the UNICEF headquarters? "I like that I can make a direct and meaningful impact. Statistics are not merely numbers on paper; they help to paint a clear picture of the situation on the ground and thus guide policies and funding decisions," said Jin Rou.

She is grateful she is able to apply what she had learnt at Faculty of Science.

She said: "The research work I was exposed to have equipped me with the basics of statistical demographics. This is why I was able to contribute immediately to the work at UNICEF. Also, I find the Student Exchange Programme I took part in at Université de Pierre et Marie Curie in Paris, has enabled me to adapt quickly to life in a new country."

It helps too that Jin Rou is fluent in English, Mandarin and French and has some basic knowledge of a few other languages.

Jin Rou is leading a purposeful life in New York City. She will continue the research she undertook as her FYP and work with her supervisor at the Faculty, to develop improved statistical methods for estimating child mortality. They aim to propose their findings to the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) at the end of the year.



Online opportunity: *Alumna Yvonne Chen puts to good use her creativity in manufacturing her own handbags and shoes, while tapping the Internet to market them as a business.*

Chen KangTing, Yvonne, businesswoman in Singapore

Yvonne runs an online store, selling shoes and handbags, some which brandishes her own brand name.

The proud owner of online store ***www.yventually.com***, Yvonne was running her business whilst still a student struggling to earn a degree. She has since graduated, not only with a Bachelor of Science (Honours) degree, but also a fully-fledged business of her own.

In fact, she could easily secure a stable full-time job.

"I chose to run my online business. Although it is a humble one, it is something I started three years ago when I was still studying at Temasek Polytechnic. Then, I was only selling jewelries I made myself. I wanted to go on making my own products and keeping the business going will enable me to do that," said Yvonne.

She began working on Yventually full-time after her last examinations this May.

Juggling between business, studies and friends and family proved to be a challenge, especially during her honours year when she had to spend most of her time in the laboratory.

Fortunately, Yvonne has supportive family members and friends who would adjust their schedule to suit hers. Her parents would help in mailing the orders for her when she was tied up in the laboratory and friends would bring her food when she was busy displaying her wares in flea markets.

Yvonne's greatest inspiration for starting her own business stems from her father. "Seeing (my father) having pride in running his own company and how driven he was made me believe that with hard work, I will be able to bring my small business venture to a whole a new level," said the 24-year-old.

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RESEARCH

Cancer cells: Arresting their growth?

Department of Biological Sciences researchers have found a way to arrest cancer cells growth through energy 'starvation'.

Synergy: *(From left) Research Fellow Dr Pan Qiurong, Catherine, PhD student Mr K Thangavelu, Associate Professor Jayaraman Sivaraman (seated) and Associate Professor Low Boon Chuan work together on their research of 'starving' cancer cells.*

Cancer cells require energy to grow and divide; they thrive by adapting their metabolic regime.

Essential to arresting tumour progression is glutaminase, the enzyme that breaks down the amino acid glutamine that the cells use as their energy source, in addition to glucose. Inhibiting it could thus effectively 'starve' cancer cells.

Determining the X-ray structure towards understanding how the glutaminase enzyme is involved in cancer metabolism and binds to the chemical inhibitor BPTES (bis-2-(5-phenylacetamido-1, 2, 4-thiadiazol-2-yl) ethyl sulfide), Associate Professors Jayaraman Sivaraman and Low Boon Chuan had made a crucial discovery.

This is a first of its kind, for the actual process of how BPTES inhibits glutaminase was not known prior to the study of the two researchers and their team.

Hope for treatment?

Assoc Profs Sivaraman and Low collaborated with Associate Professor Valiyaveettil Suresh from Department of Chemistry and Professor Herwig Schüler from Karolinska Institutet, Sweden, in their research.

The team showed how and where the binding of glutaminase to the chemical inhibitor BPTES actually occurs.

They said that they have been able to provide the first detailed structure of how BPTES inhibits the glutaminase enzyme by inducing a dramatic allosteric shift. These findings could offer a new cancer treatment regime that is more potent, yet less cytotoxic.

BPTES, with its potential as a glutaminase inhibitor and a drug, is currently being put through pre-clinical trial in the US.

Their findings are published in the journal *Proceedings of the National Academy of Sciences*.

The team has gone on to refine their research so as to identify more glutaminase inhibitors, as well as determine an effective multi-drug treatment, for cancer cells that thrive especially on glutamine. These include lymphoma, prostate, glioblastoma, and breast and kidney cancers.

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RESEARCH

Malaria detection: Now faster and better

Professor Loh Kian Ping and team have fabricated a newly improved malaria detector using graphene.

Malaria detector: *The size of a thumb device, it uses the super-thin carbon graphene that is very sensitive to electrical charges, for malaria detection.*

Researchers at Faculty of Science have come up with a faster and more accurate way – with over 99 per cent accuracy – to detect malaria. They have pieced together a device the size of a thumb, which can even pinpoint how long a malaria-afflicted patient has been infected.

The malaria detector was the brainchild of four researchers, namely, Professor Loh Kian Ping, Department of Chemistry and Graphene Research Centre; Professor Lim Chwee Teck, Department of Bioengineering and Mechanical Engineering; Ms Priscilla Ang, NUS Graduate School for Integrative Sciences and Engineering; and former Research Fellow, Dr Li Ang.

The concerted effort bodes well for multi-disciplinary research in NUS.

Graphene works

The small malaria detector uses a material called graphene – a type of super-thin carbon that is very sensitive to electrical charges.

When malaria parasites invade normal red blood cells, knobs are grown on the surface of the cells, making them sticky. These sticky knobs carry a positive electrical charge.

Using the graphene device to detect malaria, the doctor takes a blood sample, then culture it and smear it onto the device. 'Recognition proteins' formed in the device let only malaria-infected cells to roll across the graphene sheet.

The graphene gives out negative electrical charges that correspond to the cells' positive charges. Where infection is longer, the cells move slower and become more positively charged.

The researchers' findings were published in science journal *Nano Letters* last November.

Current methods

Ms Priscilla Ang, who co-authored the study, observed that the device improves on the current method of detecting malaria.

To identify malaria cells, doctors traditionally take a blood smear and dye it. Not only is this method tedious, but also problematic as the dye may colour normal cells, resulting in false positives, noted Ms Ang.

Some claim that it is sometimes inaccurate due to human errors in smearing too thick a blood sample, thus making it difficult to detect under a microscope.

Adding, Prof Lim said: "The current method is not fool-proof as it is always difficult to detect malaria infection since typically only less than 1 per cent of the blood in the human body is infected."

The graphene malaria device on the other hand, automates the detection process.

Although the new malaria detector is promising and relatively inexpensive, mass production of the device is not possible, for graphene is not made in large enough quantity.

Moving forward, the team hopes to attract pharmaceutical companies to scale up the production of graphene. They also have plans to exploit the device for the detection of other diseases such as cancer.

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RESEARCH

Chemotherapy triggers cognitive changes

A first of its kind qualitative study led by Associate Professor Alexandre Chan suggests that Asian breast cancer patients experience cognitive deterioration following their chemotherapy treatment.

Assoc Prof Alexandre Chan (from left standing) and his research team.

For Asian breast cancer patients who had or were receiving chemotherapy, physical pain is not the only thing they have to endure; they also suffer from certain cognitive deterioration. This was the finding derived from a qualitative study led by Assoc Prof Alexandre Chan and PhD candidate Ms Cheung Yin Ting from the Department of Pharmacy.

The first such qualitative study done with Asian breast cancer patients, it aimed to determine the cognitive changes that these patients experience with chemotherapy, as well as the effect that these changes have on their daily lives and their coping strategies.

Key findings

Assoc Prof Chan and team studied cognitive side-effects such as memory loss, decision-making difficulties and speech problems experienced by 43 Asian breast cancer patients who received chemotherapy treatment, or were undergoing it.

These cognitive changes that they experienced are termed as 'chemobrain'.

They found that the breast cancer patients surveyed were unaware of 'chemobrain' and assumed their experience was triggered by the physical effects of chemotherapy, or the fatigue and anxiety faced during it. Though unaware, they were seeking out ways to cope, such as consuming traditional Chinese medicine or playing mahjong or qi gong.

What was heartening from the finding was that despite the unpleasant side-effects, most were still receptive to receiving chemotherapy.

Their findings were consistent with similar research conducted on Caucasian patients and had been published in the online edition of the journal *Annals of Oncology*.

Next step

Assoc Prof Chan and his team had since embarked on a prospective, large-scale longitudinal study to evaluate the degree of cognitive changes experienced by Asian cancer patients. They are also investigating other related quality of life and psychosocial issues they have identified through focus groups.

Preliminary findings show that cognitive disturbances can differ among different Asian ethnic groups.

These results, published at the American Society of Clinical Oncology (ASCO) Annual Meeting this June, showed that Asian breast cancer patients undergoing chemotherapy experienced a significantly higher level of fatigue, anxiety and cognitive disturbances that made them being more susceptible to cognitive disturbances.

"A number of clinical characteristics (such as) chemotherapy history, anti-hormonal therapy history, emotional functioning, global health status and the interacting effect between anxiety and fatigue were found to be strongly associated with cognitive disturbances among our patients," explained Assoc Prof Chan.

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DEPARTMENT

International Biology Olympiad

Singapore plays host for the first time in this academic competition, which saw its students scoring its best results ever – four gold medals and an overall top gold.

Doing Singapore proud: *(From left) Ms Zhang Huiting, Ms Mao Haitong, Mr Nol Swaddiwudhipong and Mr Lim Yuan Wei win gold, with Nol coveting the top gold medal.*

The International Biology Olympiad (IBO) saw students being challenged to work through stimulating and novel biology problems and experiments.

Into its 23rd round, this year's IBO was organised for the first time by a team of professors and staff from the Department of Biological Sciences (DBS) at NUS, NIE, as well as staff members from the various departments within NTU and NUS. They were led by two Co-Chairs, Assoc Prof Lim Tit Meng of DBS, NUS, and Assoc Prof Shirley Lim of NIE.

A total of 236 of the world's most promising pre-university biology students and 205 officials from 59 countries took part in IBO 2012 held from 8 to 15 July.

The Singapore delegation was led by Dr Ng Ngan Kee, NUS, and Dr Beverly Goh, Natural Sciences and Science Education, NIE.

Singapore President His Excellency Tony Tan Keng Yam, Patron of IBO 2012 Singapore, graced the Opening Ceremony held on 9 July 2012, at NTU.

Impressive performance

For the first time, Singapore managed to clinch the first place in IBO.

Students Mr Nol Swaddiwudhipong, Ms Zhang Hui Ting and Ms Mao Haitong of Raffles Institution and Mr Lim Yuan Wei of Hwa Chong Institution, each bagged a gold medal. Nol also emerged the top gold medalist.

"It still feels very surreal. It has been an amazing experience getting to know other participants, and it has been such an exciting journey!" gushed Nol after being awarded the top gold medal.

The students were mentored by a team of dedicated academics from NUS and NIE, with coordination by the Singapore Institute of Biology.

Their performance this year superseded last year's performance, where Singapore came in third.

Singapore first participated in IBO as an observer country in 2000. In its first year of competitive participation – in 2001 – Singapore impressed the IBO community by winning two gold and two silver medals and was ranked third out of 39 countries. This performance was unprecedented for a first-time participating country.

The outstanding performance of the Singapore team was sustained throughout its 11 years of participation.

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DEPARTMENT

Model victory

Department of Mathematics students win in the Outstanding Winner category for the first time, at the international Mathematics Contest in Modeling, bagging the Ben Fusaro Award.

Students Xu Wenji, Zhang Jing and Lu Jingyi did the Department of Mathematics proud, scoring victory for the first time in the 2012 Mathematics Contest in Modeling (MCM).

The trio clinched one of the highest awards in the contest, outperforming more than 3,500 teams that the MCM attracted from institutions around the world.

They took part in MCM, which is primarily an online contest, held from 9 to 13 February 2012, on the advice of Professor Bao Weizhu, Department of Mathematics.

Overcoming challenges

As part of the contest, Wenji, Zhang Jing and Jingyi chose to tackle the continuous modelling problem that sought to find answers to the question, "How much do the leaves on a tree weigh".

Wenji, a Year 3 student majoring in Quantitative Finance and also the leader of the team, said of their participation: "Taking part in MCM is like doing a scientific research in a condensed version. The experience will definitely benefit us in our future careers."

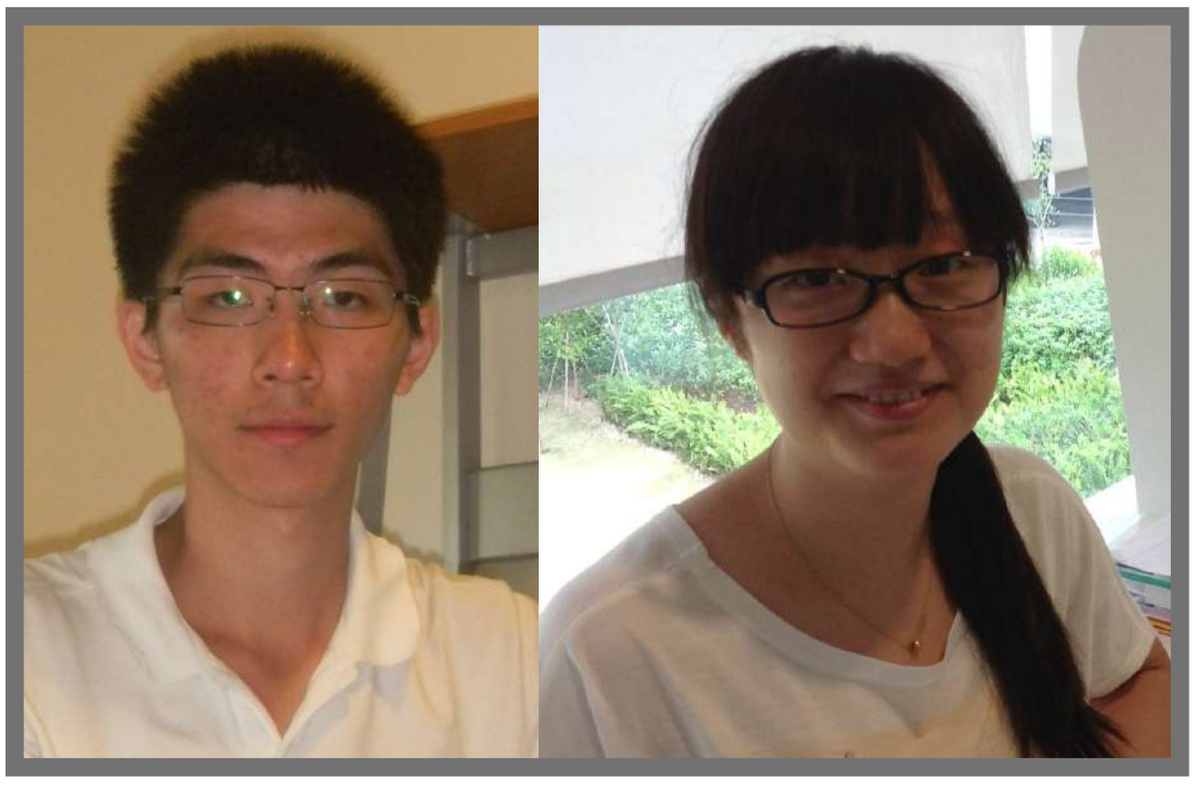
Over the five-day of the contest, the trio brainstormed, consulted numerous reference books and past literatures and went through various sub-models as a team.

One big challenge they had to overcome was to simulate the branching structures of trees. Zhang Jing, a Year 3 Mathematics major was able to use his talents in coding a programme for simulation algorithm and simulated the branching structures of trees. Jing is an expert of Matlab, a high-level technical computing language and interactive environment for algorithm development, data analysis and visualisation.

He said: "Coding the programme for simulating the branching structures of tress using Matlab was definitely not easy; it was a most challenging task for me. I consulted various reference books, and combining that with what I had learnt previously, I managed to complete the simulation for my team."

Good news

When they received news of how well they did in the MCM, Jingyi, Year 3 and Quantitative Finance major, summed up her experience. She said: "I was interested in modeling, although I had little idea of it at first. Now, I know so much more about modeling and how it can be applied to solve real-life problems. From the contest, I discovered my analytical side, which I did not know I have."



Winning team: *Team leader Xu Wenji (photo on left), Lu Jingyi and Zhang Jing (without a photo) worked together to clinch one of the highest awards in the Mathematics Contest in Modeling, for the first time.*

They received a certificate for their win. In addition, their solution paper will be featured in *The Undergraduate Mathematics and its Applications Journal*, more commonly known as *The UMAP Journal*, along with commentaries from the author and judges.

On the secret of their success, Wenji said: "The key to our winning the award is that the three of us have strengths that complement each other. I am proud of my team and am honoured to have worked with each of them."

So, what would the answers offered by the winning team have served? An accurate model to measure the weight of the leaves of a tree will aid botanists in monitoring the health of trees, consistently and conveniently, by surveying the biomass of the leaves. Ecologists will also be able to use such models to observe environmental changes and ecological phenomena.

These applications will greatly benefit botany or environment-related studies.

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DEPARTMENT

Together, we remember

The Dean's Office and Department of Chemistry mark the first anniversary of the passing of Professor (Mrs) Tan Sau Fun with a memorial gathering.

We remember: *(From left) The family of the late Prof Tan Sau Fun, Dr Ann Tan Sian Ann and Col (V) Tan Wee Kian, mark the first anniversary of Prof Tan's passing with Faculty of Science. On the far right is Mr Tan Sian Lip.*

Although it has been a year since Prof (Mrs) Tan Sau Fun has passed on, she has not been forgotten.

In remembering her significant contributions, inter alia, to the Department of Chemistry and the welfare of Chemistry students during her 35 years with the NUS Faculty of Science, a gathering-cum-dinner was held in her memory.

Unforgettable night

The memorial gathering was attended by the family of the late Prof Tan, Dean Professor Andrew Wee, members of the Faculty and department, dear friends and former colleagues.

Meaningful speeches were delivered, making the night that much more special. Anecdotes were also shared and fond memories were stirred, providing for a warm affair.

While Dr Ann Tan Sian Ann, the daughter of Prof Tan, spoke of their family life, the other speakers, touching on the contributions made, were Assoc Prof Chin Wee Shong, Vice-Dean, Outreach and Student Life; Dr Lawrence Chia, Special Advisor to the Dean's Office, Dr Sim Keng Yeow, former Head of Department of Chemistry; and Dr Tan Eng Liang, former Senior Minister of State and Finance.

Prof Tan's paintings were also showcased, reminding all of her creative talents.

A guest book signed by those who attended the memorial was presented to the family of Prof Tan as a gift from the University.

In it, Dean Prof Andrew Wee had written thus: "I am deeply grateful to see a Chemistry colleague of her stature so remembered". Prof Xu Guo Qin, the former Head of Department of Chemistry, who had worked with the late Prof Tan, penned these words in the book: "We always remember the smile of Prof Tan SF".

The memorial was held on 2 March 2012, from 6.15 pm to 9.15 pm, at the foyer of Executive Classroom, Department of Chemistry.

Family, friends, colleagues, her former students and alumni have gathered to set up, in perpetuity, the Tan Sau Fun Bursary to honour her memory and her contributions. This fund is administered by the Faculty to provide bursaries to needy Chemistry students annually. To do your bit in honouring the life and memory of Mama Tan, click ***here****.*

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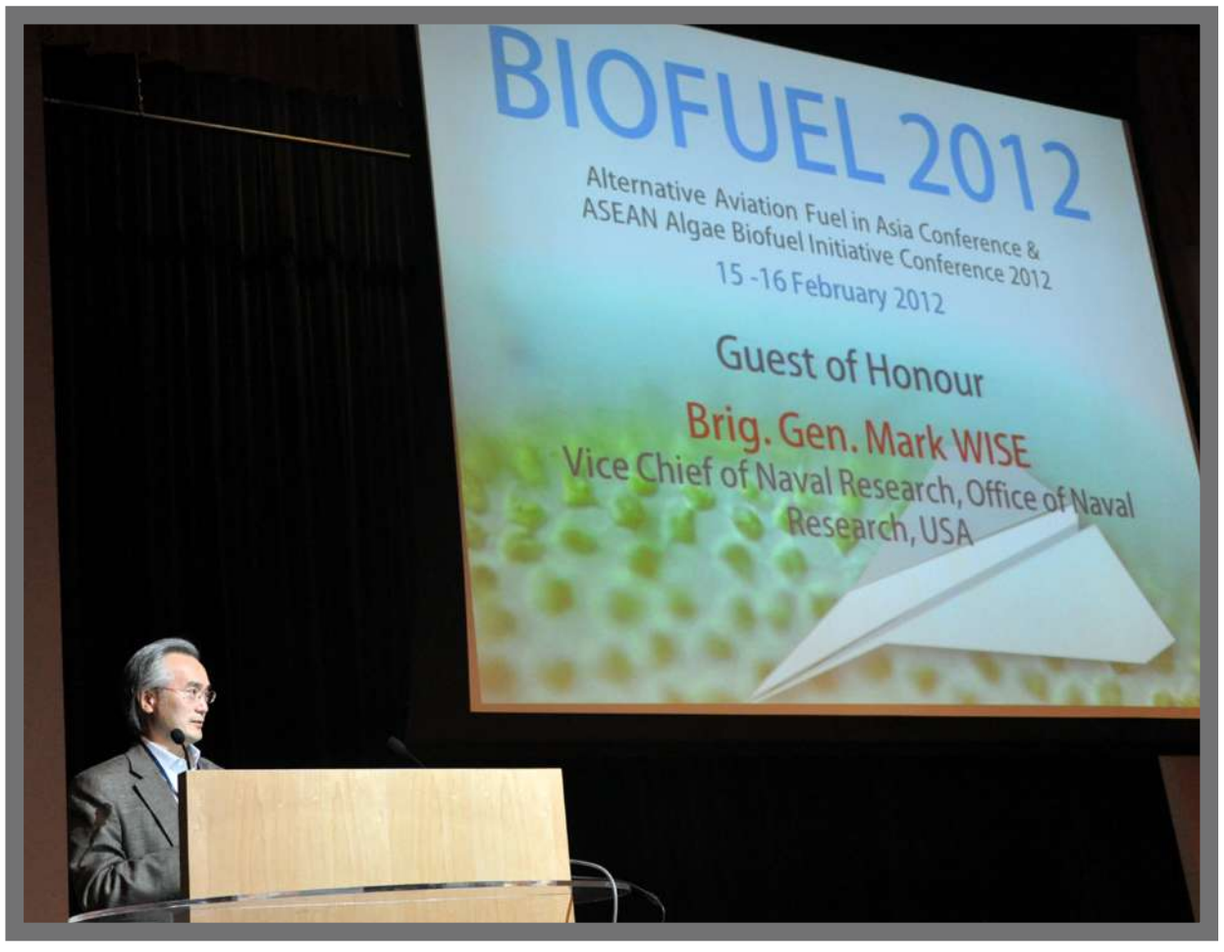
DEPARTMENT

Adopting alternatives

The inaugural Biofuel 2012 sees participants congregate to discuss alternative aviation fuels and algae-based bioenergy.



Welcome address: *Professor Paul Matsudaira, Head of Department of Biological Sciences and Chairperson of Biofuel 2012, addresses the conference delegates.*

Energy and fuel consumption around the world is getting higher, with few new major oil reserves being discovered. Clearly, there is an impending need for alternative fuel and renewable energy.

Amid this backdrop, the Department of Biological Sciences (DBS) at the Faculty of Science, and Department of Chemical and Biomolecular Engineering at the Faculty of Engineering hosted Biofuel 2012, a first of its kind.

Two-in-one

This event comprised two platforms, namely, Alternative Aviation Fuel in Asia Conference and ASEAN Algae Biofuels Initiative Conference.

It brought together research scientists, aviation professionals and students to share their experiences, technological knowhow and latest developments.

The first conference introduced the development and potential use of alternative fuels in commercial aviation to the Asian community, while the second conference brought together professionals interested in the development of algae-based bioenergy from the region. They congregated to share their experiences, technological knowhow and the latest developments made.

Professor Paul Matsudaira, Head of DBS and Chairperson of Biofuel 2012, said: "The two dynamic and instructive conferences covered a wide range of topics to discuss how algae can be used as a source for biofuel and the development of processes to mass produce biofuel that meet the standards and needs of the ASEAN region.

It was a significant platform for the fostering of interactions among scientists and engineers, and those engaged with funding, regulatory and commercial endeavours."

Sustainability

At the opening of the event, Ms Julie Oettinger, Assistant Administrator for Policy, International Affairs and Environment, Federal Aviation Administration, USA, delivered her keynote address titled 'US efforts to develop sustainable alternative fuels for aviation'.

Ms Oettinger tackled the approaches adopted by the aviation sector to develop sustainable alternative fuels that could reduce dependence on petroleum.

She also shed light on the measures that the US government has taken to enable the adoption, production and usage of sustainable jet fuels in commercial aircraft.

Ms Oettinger took the opportunity, too, to provide insights on how research and development, fuel certification, and infrastructure development are critical to the deploying of sustainable alternative fuels in aviation throughout the world.

More than 350 scientists attended the event, held from 15 to 16 February 2012, at Biopolis.

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You need not commit a fixed amount of time or be in one set place, as we will need you only when there are events to be covered and people to be interviewed.

So, if you are keen, write to editor Sarah Loke and email one of your best writing sample to ***scilwms@nus.edu.sg***, indicating under the subject header, 'Application for Student Writer'. These can be articles that you have written before, or if you do not have one, write a fresh piece on anything that you think is worth reporting on campus. We look forward to hearing from you by Monday 29 October 2012.

In your email, please remember to include your name, contact number and the course you are in.

Why not show us your talent now? Who knows you might just get your very own masterpiece published in the next issue of Omniscience for your fellow students to read!

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What's Up?

Check out the events held from October 2012 to February 2013!

OCT2012 6
- 10th Singapore National Growing Challenge

OCT2012 17
- Seminar: A Career for Science in the Courtroom

OCT2012 19
- Science Alumni-student Networking Evening

OCT2012 26 > OCT2012 28
- Halloween Celebrations

NOV2012 15
- Department of Biological Sciences Research Lab Talks

NOV2012 22
- Faculty Awards Ceremony 2012

DEC2012 8 > DEC2012 10
- 17th Biological Sciences Graduate Congress

DEC2012 13 > DEC2012 16
- 3rd Xiamen Winter Symposium – 'Metabolic Regulations and Diseases'

DEC2012 21 > DEC2012 23
- Sweat Camp

JAN2013 22
- Science Day-cum-Students Awards Ceremony

JAN2013 25
- Industry Partners Appreciation Evening

FEB2013 13 > FEB2013 15
- Valentine's Day Celebrations

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