STUDENT STORIES

Our students are increasingly tapping into their experiences and real-life issues to create winning innovations at various international hackathons.

ALUMNI STORIES

Check Out!

Two Life Sciences alumni received the prestigious NUS Outstanding Young Alumni Award this year

LOOKING AHEAD TO A CAREER IN MEDICINE
Natasha Nabila MUHAMAD NASIR
(Life Sciences, Class of 2018)

HELPING FAMILIES ON END-OF-LIFE ISSUES
Kat NEO (Chemistry, Class of 2007)

A PLATFORM FOR PERSONALISED NUTRITION AND MEDICINE
Dr LIM Seng Han (Pharmacy, Class of 2011) and Dr GOH Wei Jiang (Pharmacy, Class of 2012)

THE SCIENCE BEHIND OUR SCIENTISTS

“I am driven and inspired by the fun of uncovering the mystery of life.”

Prof CHNG Shu Sin
Young Scientist Award 2018
Walter Shaw Young Investigator Award in Lipid Research 2019

Research Highlights

Prof TOH Kim Chuan Receives President’s Science Award 2019
Emeritus Professorship Awards and Inaugural Honorary Fellowship Award
Highly Cited Researchers 2019

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Science Communication and STEM Workshop in Hanoi
NUS Foodtech Challenge
NUS - Grandes Écoles French Double Degree Programme 20th Anniversary
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NEW FOOD SCIENCE AND TECHNOLOGY DEPARTMENT

The NUS Food Science and Technology Programme (FST), Singapore’s first bachelor’s degree in this field, celebrated its 20th anniversary with a new milestone - its elevation to an academic department.

This is timely, as the food industry is an important growth sector in Singapore’s economy.

To commemorate this milestone, FST organised several events: A Charity Golf event on 26 March raised over $430,000 for a new FST Alumni Bursary to help financially disadvantaged students.

A Gala Dinner on 8 August was attended by 360 FST staff, students, alumni and industry partners.

The department also hosted the Joint International Symposium on Food Science and Technology on 1 – 2 December, chaired by Prof YANG Hongshun, which was attended by 10 universities in Asia. The research topics shared ranged from food chemistry and analysis, to food microbiology and safety, food processing and engineering, food fermentation as well as human nutrition. 32 postgraduate and undergraduate students gave oral or poster presentations, and the event drew over 100 participants.

The next symposium will be held in Kasetsart University in Thailand in 2020.

For the first time, the Faculty partnered with an ASEAN university - the Vietnam National University-University of Science (VNU-HUS) - to organise a workshop from 7 to 9 November which covered developments in STEM education, strategies to raise interest in STEM, and practical classroom pedagogy.

Prof NGUYEN Tien Giang, VNU-HUS’ Vice Rector, spoke of the pressing need to raise the quality of STEM education in Vietnam to support its economic development. Prof Leo TAN, the Faculty’s Director of Special Projects, shared on the development of STEM education from Singapore’s independence to date.

In a closing dialogue session, participants raised various topics, like making a lesson plan for interdisciplinary teaching; developing science demonstration equipment; and skills for effective STEM teaching.

Over 130 university educators, high school teachers and private educational organisations from more than 30 Vietnam-based institutions attended.

The workshop is part of the Faculty’s inaugural STEM (Science, Technology, Engineering, Mathematics) for University Educators in ASEAN Programme.
Seedling, our team from the Food Science and Technology (FST) Programme, emerged the winner in the inaugural NUS FoodTech Challenge from 10 to 17 July, which was themed Sustainable Protein, Beyond Soy.

The team walked away with $1,500 in cash, a $10,000 grant and three months of free incubation support at NUS Enterprise. Their prototype combines environmentally-friendly sustainable protein and zero waste concepts which completely replace plain flour in baked goods and pastries.

Participants were tasked to propose and create prototypes of alternative proteins, under the mentorship of leading food technology companies. A total of 22 teams of students from universities and polytechnics developed ingenious food products, such as brownies using flour made entirely from food processing byproducts (such as okara, spent coffee grounds and jackfruit seeds); vegan “pulled pork” from jackfruit etc.

The NUS-Grandes Écoles French Double Degree Programme (FDDP), which is offered exclusively at NUS and renowned for its academic rigour and excellence, celebrated its 20th anniversary on 11 November with a forum bringing together academics, industry partners, FDDP alumni and students.

Prof TAN Eng Chye, NUS President and Mr Eric LABAYE, President of Ecole Polytechnique and President of Institut Polytechnique de Paris, spoke on the changing landscape of higher education in Singapore and France, respectively. Industry partners Thales Group and Total Oil Asia Pacific shared on developments in their respective sectors, while three alumni spoke of how FDDP shaped their career pathways.

The FDDP started in 1999 as a partnership between NUS and Ecole Centrale Paris. Over the years, the collaboration expanded to six Grandes Ecoles. Some 370 NUS and French students have graduated from the programme since it started.
INTERNATIONAL HACKATHONS

Our students are increasingly tapping into their experiences and real-life issues to create winning innovations at various international hackathons.

DESTIGMATISING MENOPAUSE

During a stint at the NUS Overseas Colleges Programme (NOC) Stockholm, Fang Wen, Year 3 Chemistry, and her team members emerged champions of the McKinsey Digital Challenge at the Stockholm Tech Festival, Europe’s largest all-female hackathon, held on 7 and 8 September.

The team’s idea, Eggfree, is a business-to-business service solution that conducts experiential learning workshops at the workplace, to ‘normalise’ the topic of menopause by sparking conversations about it.

The team was inspired to create something novel that is applicable to women on a daily basis. Fang Wen said, “It was an eye-opening experience to be able to work on taboo topics like menopause. I met many others who are likewise trying to develop solutions to improve women’s lives.”

The team faced strong competition from more than 400 participants, but edged out other teams to take home the top prize!

CLEANING THE OCEAN OF MICROPLASTICS

FOO Tun Shien, Year 2 Environmental Studies, and his team mates were selected from over 2,000 entries worldwide as finalists in the global Ericsson Innovation Awards 2019 in Sweden on 11 December. Participants developed novel ideas to harness the power of water and underwater material environments to address global challenges.

The team created fully automated “smart” ocean vacuum robots, with seawater-powered batteries, to collect microplastics via manta-ray inspired filtering mechanisms that rely on satellite communication for positioning, cross-communication and autonomous movement.

Tun Shien said, “We are just getting started in taking this innovation to greater heights to create a positive impact on the environment.”

DIAGNOSTIC BIOPSIES IN A HOME SETTING

LOW Zi An, Year 3 Life Sciences, and his team mate developed a rapid diagnostic liquid biopsy test kit for cancer that can be administered in a home setting. Based on Zinc Finger protein detection of circulating tumour DNA (ctDNA), the test kit relies on BRET (Bioluminescence Resonance Energy Transfer) as the principal mechanism for ctDNA detection. The low-cost test kit is easy to use, and saves time and money. It can be modified to allow for the detection of multiple cancers at the same time, and its ease of use makes it suitable for home use. The test is also done ex vivo.

This innovative solution beat health technology teams from around the world to become champions in the Mundipharma Cancer Care Challenge on 28 June. The challenge seeks game-changing solutions harnessing technology to change the lives of cancer patients.

TRACKING WELL-BEING OF ELDERLY

LIM Xuan Hui, Year 3 Quantitative Finance, and his team members from NOC Shanghai emerged champions at the Shanghai Makers Hackathon under the Shanghai Science and Technology Festival held on 15 and 16 June.

He said, “We sought to address the social problem of the ‘phantom’ elderly who lead invisible lives in the community.”

The team devised a simple, easy-to-use dashboard for welfare organisations to track the elderly in their care. It pushes notifications to social workers to engage inactive seniors, with the hope of averting injuries or tragedies.

Their efforts also led to their winning the Young Technologypreneur Award (2019). The team was one of 21 international and Chinese teams to compete in the hackathon.

Outstanding Young Alumni Award Winners

Two Life Sciences alumni received the prestigious award this year, doing the Faculty proud.

Congratulations, Jingmei and Shamir!

Dr LI Jingmei (2006)
Breast Cancer Researcher Genome Institute of Singapore

Jingmei studies an often-overlooked risk factor - breast density. Her research has shown that women with very dense breast tissue are at a higher risk of developing breast cancer. This enables targeted early diagnoses and treatment of at-risk women.

Accolades

UNESCO-L’Oréal International Fellowship (2016)
Young Scientist Award, Singapore National Academy of Science (2017)
Education T List, Teller (2018)
Junior Chamber International Ten Outstanding Young Persons (Singapore) (2018)

Muhammad Shamir Bin Abdul Rahim (2008)
Founder VersaFleet

VersaFleet’s app digitalises and improves the way supply chains manage their land transport vehicles. It has raised $2.8 million in funding and expanded to Malaysia, Indonesia, the Philippines and India.

Accolades

Young Entrepreneur of the Year (2016) Singapore Malay Chamber of Commerce and Industry
Member of ‘Future Cities’ Subcommittee (2016) on the Future Economy, and various national committees

Looking Ahead to a Career in Medicine

At the age of three, Natasha Habiba MuHAMD NASSIR still remembers seeing a doctor frequently for a mycoplasma infection. Her physician’s care comforted her and inspired her interest in medicine, especially as a pediatrician.

Today, 24-year old Natasha is on her way to achieving her dreams. The Life Sciences alumni is continuing her studies at the Duke-NUS Medical School to earn a Doctor in Medicine degree.

Coming from a humble background - her mother is a housewife and her father an aircraft technician - Natasha shares that her parents’ strong support is what fuels her pursuit of excellence.

This guiding principle has served her well. Natasha not only aced the Primary School Leaving Examination (PSLE) examinations, she set a record for the highest score in Singapore with a staggering 294 points.

An enthusiastic volunteer at the Cerebral Palsy Alliance (Singapore), Natasha hopes that a future career in medicine will enable her to make a difference towards the healthcare scene in Singapore, especially for children.

Our Students

Our alumni

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Craft Health, founded by Pharmacy alumni Dr GOH Wei Jiang and Dr LIM Seng Han, is one of two deep technology startups from the inaugural batch of the new NUS’ Graduate Research Innovation Programme (GRIP).

Craft Health markets a proprietary 3D printing (3DP) platform for personalised nutrition and medicine. Tablets of various combinations, shapes and geometries can be easily printed using their proprietary formulations and an in-house printer. Craft Health has also developed its own formulation database, including formulations for immediate, delayed and sustained release profiles, as well as custom-made solutions for 3D printing without heat or UV curing.

The idea was born in 2017 when both of them were Ph.D. students here. Dr Goh said, “There is a growing demand for personalised medicine, especially amongst paediatric, elderly and some special patient groups. 3DP could address this gap, by combining and customising different medications and supplements into a single daily pill. This helps patients who struggle to keep track of their medication regime.”

Topics like end-of-life decisions or incapacity often create uncomfortable emotions. Many people put off legacy planning as a result.

Chemistry alumna Kat NEO was driven to co-found Timeliss in 2017, a one-stop online legacy planning platform, after witnessing her mum’s passing. Timeliss has since garnered accolades, emerging amongst the winners in social innovation initiatives Singtel Future Makers (2018) and Modern Aging Singapore (2018).

Timeliss seeks to provide end-of-life information in an accessible and affordable way. Its services include a tribute platform, life planning account, community and stories forum, and online information resources. By bringing together lawyers, medical / healthcare practitioners, estate planners, etc., Kat hopes that Timeliss can be the go-to portal enabling families to cohesively manage late-life matters.

Kat attributes her entrepreneurial grit to her experience as a new mother. “Being a ‘mumpreneur’ instils a strong sense of discipline and purpose, and makes me appreciate the little things in life.”

I hope to empower people so that they are better prepared for life’s unexpected events.

Kat NEO
Chemistry Alumna
GLOBAL SCIENCE SUMMER PROGRAMME (GSSP)

18 international students and 73 NUS students gained subject knowledge in cutting-edge scientific fields such as biotechnology and biotherapeutics, data science and analytics, forensic science, and medical physics in this year’s programme, from 15 to 26 July. They also visited Sapporo Bihoro Wetland Reserve to experience Singapore’s biodiversity, and gained insights into Tsing Hua’s heritage in the specially organised cultural programme.

22 students from NUS and Hokkaido University attended lectures and field trips in Sapporo from 4 to 10 August, and in Singapore from 9 to 14 December, where they were introduced to the comparative study of crop production in natural and controlled environments, from farmland to farm factories. They studied the use of agriscience, agritechnology and agronomy to improve field crop selection and production.

At ComCrop, Singapore’s urban farming pioneer, students observed hydroponics farming to grow Japanese chye sim, basil and lettuce. Temasek Polytechnic’s Aquaculture Innovation Centre gave students insights into aquaculture for marine life cultivation for food, as well as novel innovations like extracting chitin from crabs for haemostatic dressing, cleaning water with a biofloc waste management system. The students also visited the Citizen Farm, a community farm that practises hydroponics farming, geoponics, mushroom farming and permaculture.

Guest lecturers Prof Paul TENG, Managing Director, National Institute of Education International (NIEI), and Senior Fellow and Adviser in Food Security, S. Rajaratnam School of International Studies (RSIS), discussed food security in Singapore, while Mr Kevin FERNANDEZ, Research and Agronomy Manager, OLAM International, shared on the company’s global production and sustainability practices.

In Sapporo, the participants harvested their own potatoes and made waraji, traditional Japanese straw sandals, from rice straw. They also witnessed a live auction at Sapporo Central wholesale market.

NUS-HOKKAIDO UNIVERSITY: AGRI-SCIENCE IN JAPAN AND SINGAPORE

13 students from NUS and Hokkaido University participated in this six-week intensive programme from 10 June to 18 July, where they attended lectures and field trips in Hokkaido and Singapore.

They visited the Hakodate Morning Market where they witnessed the auction process and experienced firsthand how food preservation works, by canning their own fish. They also observed how a steam heater is used to sterilise canned products, with a high pressure liquid heater as an alternative.

They attended lectures and field trips in Hokkaido and Singapore.

NUS-HOKKAIDO UNIVERSITY: SEAFOOD SUPPLY CHAINS IN JAPAN AND SINGAPORE

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Student Community Projects

PROJECT ANGEL XXII:
HEART STRINGS – Moulding DREAMS, TOUCHING HEARTS

During a visit to Ha Giang, Vietnam from 19 May to 13 June, the Science Club’s Project Angel XXII members worked with YESO, a social enterprise in Vietnam, to assist Nam Te Village residents and Thon Tha Village orphans. At Nam Te Village, they helped in kindergarten classes, and gave the local villagers a taste of Singaporean dishes and games. In Thon Tha Village, they conducted confidence-building activities for the children.

Cheryl TAN, Year 3 Life Sciences, said, ‘It was heartwarming that the children were always eager to engage in our activities and interact with us. We hope the kindergarten we built will provide the children proper education from a young age.’

SINGAPORE CHILDREN’S SOCIETY MENTORSHIP PROGRAMME

The Science Club’s Science Volunteer Corps (SVC) collaborated with the Singapore Children’s Society (SCS) to provide a regular mentorship programme for primary school children under SCS’ care. The programme had three main objectives – instilling emotional self-awareness, developing leadership and teamwork skills, and building self-confidence.

APPRECIATING LIVES, INITIATING VOLUNTEERISM EVERYDAY (ALIVE!)

ALIVE! brought together more than 60 beneficiaries and 55 student volunteers, who bonded through traditional games and food that the elderly are familiar with from their childhood. Themed Reminiscence, the event on 7 June sought to promote intergenerational bonding between seniors from the Caregiving Wellness Association, children from the Singapore Children’s Society, Young Women’s Christian Association, and Fei Yue Family Service Centre, and student volunteers.

The seniors got to step out of their daily routines at home to have meaningful interaction with the children, enabling them to better understand each other despite their age differences.

INTERNATIONAL RESIDENTIAL SUMMER COURSE

46 students immersed themselves in the research and learning experience of topics ranging from DNA to proteins expression, genes and genomes etc. during this intensive programme organised by the Department of Biological Sciences from 15 July to 2 August.

- Through hands-on laboratory sessions, lectures and engaging quizzes, as well as guided tours to key research facilities and thought-provoking discussions on topics such as the use of animal models for human diseases, and solving crimes with life sciences research - students gained exposure to modern biological knowledge and research techniques.

- Fun activities were also organised, such as learning Korean pop dance routines, viewing dinosaur fossils at the Lee Kong Chian Natural History Museum, visiting Gardens by the Bay and Night Safari, and experiencing Singapore’s hawker food culture at Lau Pa Sat.

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DREAMS, TOUCHING HEARTS – PROJECT ANGEL XXII:

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2ND STUDENT LIFE AWARDS

We are proud of our students and student groups who made significant contributions to the NUS community beyond their studies. Here we highlight some students who received awards at the ceremony on 2 November.

In this inaugural project, students shared their food science-based knowledge to equip farmers in Laos with skills to improve the desirability and shelf-life of products. They also provided insights into converting food waste generated from unsold crops into useful, marketable products.

Project Moraki
Youth Expedition Project (YEP)
FoodScience and Technology Society
Community Service (Merit) Award

Our students also participated in other award-winning projects, competitions and sporting activities, receiving accolades in Community Engagement, Community Service, Competitions (Non-Sports) and Competitions (Sports).

More information on the award recipients can be found [here](#).

STUDENT LIFE STUDENT LIFE

Predict the Future with AI

AI Bootcamp: Predict the Future with AI

Recognising the growing impact of Artificial Intelligence (AI) and deep learning on businesses and industries, the collaborative AI Bootcamp with Terra AI on 29 July, 31 July and 2 August offered five hands-on laboratories and the experimental techniques.

“Data science is an emerging field, and I am grateful for the support that enables me to pursue my studies.”

LOW ZI An
Year 3 Life Sciences
Roche Singapore Technical Operations Prize

“I enjoy experimental physics as I get to learn the theory behind observed physical phenomena, and the experimental techniques.”

LAU Shi Yun
Year 4 Physics
Arthur Rajaratnam Prize

Science Student Awards

The Faculty held our annual Science Student Awards on 23 September, to recognise students for outstanding performance in a particular field of study. 30 award recipients and Heads of Departments attended the event, together with benefactors whose generosity made the awards possible.

“Data science is an emerging field, and I am grateful for the support that enables me to pursue my studies.”

Garrick LIM
Fresh Chemistry graduate
NUS Outstanding Undergraduate Researcher Prize (OUERP)

“The OUERP provided invaluable out-of-classroom opportunities for undergraduates to be mentored by leading faculty and academics.”

FONG Wei Jie
Year 3 Data Science and Analytics
Inaugural Singapore Prison Service Data Science and Analytics Prize

“The prize strengthens my conviction to do my utmost best, and to give my all in my lifelong learning journey.”

LOW ZI An
Year 3 Life Sciences
Roche Singapore Technical Operations Prize

“I enjoy experimental physics as I get to learn the theory behind observed physical phenomena, and the experimental techniques.”

LAU Shi Yun
Year 4 Physics
Arthur Rajaratnam Prize

Awards and Awards

Arthur Rajaratnam Prize

LAU SHI Yun
TAN Hong Kiat

Gruvian Food Excellence Prize

LEE Shih Hao
Lim Seo Peng Book Prize

Way Tan
LEE Ting Yuan

Fussell College Medal

Anson LOW Becon Hao

HH Roberts Prize

Raney Punth PRAJNA

Outstanding Undergraduate Researcher Prize

NE Weng Hong
LM Kong Ru Garrick
NG Kai Ming Nicholas

Runme Shaw Book Prize

LIEM Cheong Kye
LM Kwee En, Ciaransa

“The DURP provided invaluable out-of-classroom opportunities for undergraduates to be mentored by leading faculty and academics.”

Garrick LIM
Fresh Chemistry graduate
NUS Outstanding Undergraduate Researcher Prize (OUERP)

“This prize strengthens my conviction to do my utmost best, and to give my all in my lifelong learning journey.”

LOW ZI An
Year 3 Life Sciences
Roche Singapore Technical Operations Prize

“I enjoy experimental physics as I get to learn the theory behind observed physical phenomena, and the experimental techniques.”

LAU Shi Yun
Year 4 Physics
Arthur Rajaratnam Prize

15
Science Alumni-Student Networking Evening

21 alumni mentors across different industries, such as food and agrotechnology, information and communications technology, pharmaceuticals, healthcare etc. joined 120 Science undergraduates, postgraduates and alumni at the event on 18 October.

The students gained useful insights from the alumni mentors, who shared on their personal and career journeys. They also picked up job tips at career consultation sessions with our Science Career Advisors.

Dr Turkay KONDACI (Ph.D. in Food Science and Technology (2010)) (right), Senior Manager, Global Feedstock Processing, AgrProtein, shared on his role in overseeing feed plant process development and using research data and learnings to improve yield and bioconversion globally.

“I AM NOW BETTER INFORMED OF THE DIFFERENT OPTIONS AVAILABLE TO ME.”

LIN WEI SIANG ISAAC
YEAR 3
STATISTICS

Mr Lai Weichang (Physics (2010)) (left), who co-founded numerous startups including ManyTutor.com and Otaku House, brought the students through his entrepreneurship experience in various industries - including setting up an online network for tutors and a lifestyle retail brand specialising in anime-related gifts and novelties.

Mr Berwyn CHONG (Chemistry (2013)) (right), research specialist in Procter & Gamble, shared on his experiences working in the fast moving consumer goods (FMCG) industry.

Mr Bucky HUSSAIN (Life Sciences (2013)) (right), Business Development Analyst at Google, delved into his role in building Google’s sales strategy to acquire new advertisers in the Asia Pacific.

The yearly event is organised by the Faculty and supported by the Centre for Future-ready Graduates (CFG).

INDUSTRY-STUDENT ENGAGEMENT

Through industry engagement events covering diverse growth sectors, the Faculty hones our graduates’ industry-relevant skills to prepare them for the workplace of the future. Here we highlight recent events.

SINGAPORE POLICE FORCE CAREER SHARING SESSION

On 11 October, four Singapore Police Force (SPF) officers - SUPT Shannon LIN (Chemistry 2009), DSP Eric CHONG, DSP Leslie KANG (Physics 2009) and ASP Kevin LEE (Mathematics 2012) gave our students a peek into life as a police officer.

SUPT Lin gave an informative presentation on SPF’s career progression roadmap and scholarship opportunities for students. He also shared how the modules he took as a Science student in NUS helped him in his career. At the Q&A session, the officers shared about their experiences at SPF as well as important traits and qualities sought in prospective employees.

“The officers’ sharing, I now understand how their vocations are more than just a job.”

TAN KOH WEI GAVIN
YEAR 1
LIFE SCIENCES
As part of the FST Programme’s 20th anniversary, a charity golf event was held on 26 March, which raised over $430,000 to help financially disadvantaged students reap the full benefits of the Faculty’s holistic educational experience. Nine sub-named awards were also set up.

At the Department of Chemistry’s 90th anniversary celebrations in conjunction with NUS’ Bukit Timah Homecoming on 6 July, a Science Merit Scholarship was named after Chemistry alumnus Mr GOH Choo San, an outstanding chemistry and biochemistry student who achieved international acclaim as a dancer and choreographer. His brother-in-law Mr Daniel TEO, a noted real estate developer and philanthropist, together with his family, contributed generously towards the scholarship.

**Food Science and Technology (FST) Alumni Bursary**

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**Goh Choo San Science Merit Scholarship**

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**Research Highlights**

The Faculty is at the forefront of cutting-edge scientific research. Our researchers are realising this vision in their various fields by breaking new ground and gaining acclaim for their work.

In this column, our researchers share their achievements, the challenges and rewards of their work, and their plans moving forward.

Prof Chng’s work in bacterial lipid trafficking and membrane homeostasis has provided new insights into the fundamental principles of how bacterial cells assemble and maintain homeostasis of their outer membrane. Prof Chng was the recipient of the 2019 Walter Shaw Young Investigator Award in Lipid Research—the first time it was awarded to an Asian scientist by the American Society of Biochemistry and Molecular Biology—and the Faculty’s Young Scientist Award (2018). In 2019, his laboratory was featured in the “Future of Biochemistry: The International Issue” in the journal Biochemistry. Prof Chng has received numerous teaching awards from the University and Faculty.

The outer membrane is the first point of interaction between these bacteria and their environment, and it is an effective barrier that makes Gram-negative bacteria resistant against many antibiotics currently used. More worryingly, many of these bacteria are becoming resistant to even the few antibiotics that can resolve such infections. The world is running out of options to treat patients with infections caused by drug-resistant bacteria, which spells major trouble for medical procedures such as invasive surgery, transplants, and even C-sections, etc.

I hope to be able to translate knowledge gleaned from our work to combat bacterial infections and possibly, overcome the problem of antimicrobial resistance. Just as important, my research seeks to uncover the inner workings of the cell. Biological membranes are the characteristic feature of all living matter, but currently, we do not know a lot on how they are made and/or maintained.

Therefore, my laboratory uses the bacterial outer membrane as a model to study membrane assembly. Our ultimate aim is to discover fundamental knowledge on membrane assembly processes that can inform future generations.

While lipids are tricky to work with, and understanding the specific processes of bacterial lipid transport takes a great deal of effort and time, I am greatly encouraged that our work in this field has gained recognition. I also take pride and joy in the achievements of my research group members.

It would be great to have more scientists in Singapore focusing on the bacterial cell envelope. Collectively, our work could build up towards a thematic programme for bacterial cell surface and pathogenesis research. We are now organising such a programme, and will be calling this the BUG (as in bacteria) Centre for Advanced Molecular Pathogenesis (or BUG-CAMP) programme, so stay tuned!
Prof Toh Kim Chuan, Department of Mathematics, is internationally recognised for his work on computational optimisation. He received the prestigious President’s Science Award (2019) for his fundamental contributions to the theory, algorithms and applications of convex optimisation, especially the development of algorithms and software for semidefinite and conic programming.

Emeritus Professorship Awards and Inaugural Honorary Fellowship Award

Prof Chou Loke Ming and Prof Tan Teck Koon from the Department of Biological Sciences (DBS) were appointed NUS Emeritus Professors in July. The Emeritus Professorship is awarded to professors on retirement in recognition of their sustained contributions to teaching, research and service to NUS.

Prof Chou turned his fascination with the sea into a 30-year career in marine ecology and conservation, gaining international recognition for his research expertise in coastal management and reef restoration. He also contributed actively as Director of the then new Bachelor of Environmental Studies programme and as a Management Committee member of the Masters in Environmental Management programme since its inception.

Prof Tan’s passion in teaching and research in fungal biology impacted the lives of many students. His belief, leadership and advocacy for a holistic education led to significant initiatives in student life and development that benefitted the wider NUS student community. These included programmes and setups for students with special needs, student residential life, career preparation, mental well-being, leadership training, and service learning.

DBS’ Prof Loh Chiang Shiong is the Faculty’s inaugural recipient of the NUS’ new Honorary Fellowship scheme, which recognises retired Associate Professors for their positive contributions at the University- and Faculty-level. Prof Loh is known for his research in plant tissue culture and is a multiple award-winner for teaching excellence.

Our professors were presented their awards at a ceremony held on 6 December in conjunction with DBS’ 70th anniversary, which was officiated by NUS President Prof Tan Eng Chye. The anniversary also featured a cake cutting ceremony, a reminiscent speech by Prof Tan Teck Koon, performances, table games, best dressed awards and lucky draw prizes.

Congratulations to our faculty members on receiving these prestigious accolades!
Our four distinguished guest speakers impartedvaluable knowledge, gleaned from their illustrious careers, to the graduates.

### Guest Speakers

**Mr HOW Ti-Hwei** (Country President, AIA Singapore)

"Define your success based on your professional achievements, and equally important, your relationships and health."

**Prof NG Huck Hui** (Dean, A*STAR Graduate Academy)

"Learning does not stop after you get your degree. It continues when you step into the workplace."

**Miss CHEW Kai Hwa** (Managing Director, Quantum Chemical)

"We should learn, learn and learn in a lifelong process."

**Dr Mervin ANG Chunyi** (Visiting Scientist, Singapore-MIT Alliance for Research and Technology)

"As we strive towards greater achievements, let us always remember how far we've come."
Faculty Events

NUS Day of Service

A Quantum of Science

Some 40 faculty, staff and students from the Faculty’s Young Educators in Science and Special Programme in Science, and the Centre for Quantum Technologies organised a science show-and-tell session for the public at Science Centre Singapore (SCS). The session featured demonstrations such as magnetic levitation of superconductors, electron diffraction and scanning tunneling microscopy. This was held in conjunction with “Quantum: The Exhibition” at SCS.

Science Industry Day

Science Industry Day on 19 September was a two-part event that comprised industry talks and an industry fair that brought together employers from various sectors who provided career advice, and showcased job opportunities, internships and other career options for Science students and graduates. The industry talks focused on the emerging areas of Artificial Intelligence (AI) Disruption and Future Food.

Mr Andy NAYLOR, Head of Digital Strategy and Transformation Asia Pacific, Merck Life Science, spoke on how Merck taps on emerging technologies to create value. SGInnovate organised a fireside chat with Mr LEE Jin, Head of Delivery, Taiger Singapore, and Mr Will HANSCHELL, Co-Founder, Pencil, to discuss AI: Disruption or Opportunity? Dr WU Yuan Sheng, Director, National Centre for Food Science, Singapore Food Agency, shared on the food safety regulatory system, and Mr Anton WIBOWO, Chief Executive Officer, Trendlines Agrifood Innovation Centre, discussed the science and technology of agriculture and the food supply chain.

The event was supported by NUS’ Centre for Future-ready Graduates (CFG).

Graduate Welcome Reception and Best Graduate Researcher Award

This annual event, held on 7 August, welcomed new graduate students in the Faculty and recognised the research excellence of current graduate students.

Vice Dean of Graduate Programmes Prof LU Yixin’s welcome speech covered graduation requirements, safety and disciplinary matters, and an overview of NUS’ and the Faculty’s counselling and support services.

Mr TEO Wei Jie, Department of Chemistry, was presented the Top Graduate Researcher prize for his research, which focused on cobalt-catalysed hydrosilylation of alkynes. Posters depicting the winners’ research topics were displayed. The winners each received a certificate and cash prize.

This followed with talks by guest speakers Dr Magdeline NG from NUS’ Science Library; Dr Gwendeline WONG from the Centre for Future-ready Graduates; and Ms CHANG Yuqi from the Graduate Students’ Society.

L.E.G.O. Week: Day of Service

Students and volunteers collaborated with Transient Workers Count Too (TWCT) to bring 46 migrant workers on an excursion to Gardens by the Bay. Held as part of the NUS Students’ Science Club’s annual L.E.G.O. (Loving. Enriching. Giving. Outreach.) Week, students carried out daily booth activities before the excursion, based on the themes of Assumptions, Empathy, Appreciation, Equality and Support.

Helping wildlife

About 24 NUS Forensic Science faculty, staff, students and alumni from other faculties, visited the ACRES Wildlife Rescue Centre to help with their wildlife rescue outreach activities.

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Themed Cultivating a Healthy Lifestyle for a Safe Workplace, Safety Day on 25 September
sought to create safety and health awareness amongst faculty members, staff and
students, through a programme of exciting activities including talks, safety competitions and a
carnival.

Our industry sponsors and supporters, namely Esco Micro
Pte Ltd, PDS International Pte Ltd, and Merck & Co.,
showcased their laboratory and safety products at the carnival.

Prof LU Yixin, Vice Dean for Graduate Studies and Safety, kickstarted the event with a welcome
address.

Prof Jayaraman SIVARAMAN, Safety Chair, Department of Biological Sciences, discussed the
practical aspects of cultivating a safety culture at the workplace.

Participants took part in games such as “Wheel of Safety”, “Know Your GHS”
(Globally Harmonised System of Classification and Labelling of Chemicals)
and “Steady-Ping Safe”, which tested their safety knowledge.

Participants also attended a series of health and wellness talks over two weeks, on different topics like orthopaedics,
suicide prevention and stress management.

Dr Patrick TAN, Director, NUS University Health Centre, gave insights on effective stress management.

The Department of Pharmacy received the Best Performing Department award for laboratory safety.

NUS Mathematics Events

The Department of Mathematics organised several commemorative activities in March, including a public lecture by Emeritus Professor Louis CHEN on rare events; a celebratory reception at the University Cultural Centre where colleagues, ex-colleagues and alumni were treated to the opening show of the NUS Arts Festival 2019: A Disappearing Number; and a 90th anniversary Distinguished Lecture series by Prof David VOGAN of the Massachusetts Institute of Technology and Prof Jean-Bernard LAISSERRE of the Centre National de la Recherche Scientifique. The department also collaborated with the NUS Centre For The Arts to organise Singapore’s first mathematics-themed arts festival, which uncovered and celebrated the infinite possibilities where arts and mathematics meet.

NUS Pharmacy Last Lecture Series

The Department of Pharmacy organised a three-part series of Last Lecture, a hypothetical “final talk” where academics are asked to reflect on what matters most to them.

First lecture, 23 May - Prof LEE Chuen Neng, Yong Loo Lin School of Medicine and Faculty of Engineering, cited his rich travel experiences as an allegory of life to illustrate points such as breaking free out of comfort zones, staying curious and appreciating beauty.

Second lecture, 17 August - Drawing on his experience with leprosy rehabilitation work in Yunnan, China, Dr TAN Lai Yong, College of Alice & Peter Tan and Saw Swee Hock School of Public Health, shared on the pitfalls in a society where people are accustomed to suppressing pain, and facing it only when it affects daily life.

Last lecture, 7 December - Prof Lita CHEW, Chief Pharmacist, Ministry of Health and Head of Pharmacy Department, National Cancer Centre Singapore, delved into stories on her personal journey from her humble beginnings to where she is today, drawing parallels from the poem Ithaka by Constantine P. CAVAFY.
Amgen Scholars Programme

NUS Life Sciences and Pharmaceutical Science students, selected from more than 500 outstanding applicants globally, were among the first to participate in the prestigious Amgen Scholars programme.

They had a unique opportunity to engage in scientific discovery under the guidance of top biomedical research scientists. This culminated in a symposium on 3 and 4 August where they presented their research projects and met with other scholars and leading scientists from industry and academics. They also toured Amgen’s manufacturing facilities in Singapore.

In 2018, NUS became an Amgen Scholar host institution, joining a list of distinguished host institutions worldwide partnering the Amgen Foundation to advance excellence in science education. The inaugural programme was held in NUS from 3 June to 2 August.

LEE KONG CHIAN NATURAL HISTORY MUSEUM (LKCNHM) EVENTS

Launch of 200: a natural history exhibition

On 3 June, as part of Singapore’s Bicentennial celebrations, LKCNHM launched an exhibition documenting the past 200 years of Singapore’s natural history. NUS President Prof TAN Eng Chye presented Guest of Honour, Minister for Culture, Community and Youth Ms Grace Fu with a thematic book charting 200 events in Singapore’s history. An 18K gold plated medalion coin engraved with the portraits of renowned naturalist Alfred Russel Wallace, and his assistant Ali, was specially designed for the exhibition, which runs until June 2020.

Wallace & Ali Statue Launch

A statue of British naturalist Alfred Russel Wallace and his assistant Ali was unveiled on 30 August. The statue celebrates Wallace and Ali’s explorations in the Malay Archipelago, of which Singapore is a part of. Senior Minister and Coordinating Minister for National Security Mr TEO Chee Hean was the Guest of Honour.

YES, CAPTains! camp

As part of the NUS-Chinese Development Assistance Council (CDAC) Science In! initiative, the Faculty’s Young Educators in Science (YES) worked with the College of Alice and Peter Tan to launch the inaugural YES, CAPTains! camp, held from 2 to 4 June, for 30 CDAC secondary school student beneficiaries. YES members designed a range of hands-on workshops, cast in the format of a mathematics and science quest, for the participants. The camp also allowed the beneficiaries to experience college and dormitory life.

Science Summer Camp

From 4 to 9 July, about 120 participants attended workshops and lectures on topics such as cryptography, smartphone microscopy, forensic science, three-dimensional printing, and more. They also learnt about science concepts through exciting experiments at the Science Demonstration Laboratory.

The Department of Physics held an extended Specialised Workshop from 10 to 12 July, where 27 international high school students had the opportunity to engage in hands-on activities such as laser cutting, identifying unknown samples with various identification tools, trying out Olympiad experiments and stargazing. They were also shown the department’s facilities.

Outreach

Science Summer Camp

From 4 to 9 July, about 120 participants attended workshops and lectures on topics such as cryptography, smartphone microscopy, forensic science, three-dimensional printing, and more. They also learnt about science concepts through exciting experiments at the Science Demonstration Laboratory.

The Department of Physics held three camps, namely the Physics Immersion Camp from 3 to 4 June, Physics Challenge Camp from 14 to 24 July, and Physics Discovery Camp from 15 to 22 August. Participants attended lectures, watched live demonstrations, engaged in hands-on activities and toured various research laboratories.
Every year, our departments organise enrichment camps for secondary school and junior college students to share on their academic programmes and real-world applications.

**Statistics and Data Science Enrichment Camp**

Over 80 secondary school and junior college students attended the camp on 7 June. On top of programme talks, students were treated to interesting lectures on probabilistic decision making through a climate game. They also learnt through hands-on activities about a complex data processing pipeline - from data collection to visualisation, and analysis - by feeding their heart rate data under rest conditions, and after mental and physical exertion, through an Arduino microprocessor.

**Physics Enrichment Camp**

Over 260 secondary school and 100 junior college students heard about the latest research findings in quantum technologies, biophysics and two-dimensional materials during the camp from 11 to 14 June. They also witnessed physics in action through interesting demonstrations, and gained exposure to sophisticated research techniques using instruments such as the Atomic Force Microscope (AFM), Scanning Electron Microscope (SEM) and X-Ray Diffractometer (XRD).

**Learning Journeys to NUS Science**

15 science teachers from 12 secondary schools and three pre-tertiary schools gained better understanding of the concepts of evolution, biodiversity, conservation and sustainability at this two-day workshop, from 6 to 7 June.

They attended lectures and hands-on laboratory sessions covering areas ranging from tropical biodiversity and conservation, and plant biodiversity, to specialised topics like evolution, and human impacts and sustainability.

**Teachers’ Workshop**

52 students from four junior colleges and seven students from the NPS and Global Indian International Schools gained insights into molecular biology, as well as better understanding of the immense work behind some impactful discoveries reported in textbooks.

The participants also undertook hands-on laboratory work to extract and separate DNA, and learnt to analyse their results.

The workshop on 3 June was jointly organised with the 46th NUS Life Sciences Society, and supported by the NUS Young Educators in Science (Life Sciences Focus Group).

**Crustacean Diversity and Dissection Workshop**

It was an intriguing and informative experience for 60 Eunoia Junior College students who attended this workshop on 3 June.

They learnt about basic crustacean biology, anatomy as well as adaptations. They also tried their hand at dissecting prawn and crab specimens to study their anatomy, and were able to relate the crustaceans’ forms to their functions through the show-and-tell segment.

**DNA Workshop for Pre-University Students**

52 students from four junior colleges and seven students from the NPS and Global Indian International Schools gained insights into molecular biology, as well as better understanding of the immense work behind some impactful discoveries reported in textbooks.

The participants also undertook hands-on laboratory work to extract and separate DNA, and learnt to analyse their results.

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The Department of Chemistry hosted 22 students and two staff from Zhejiang University on 22 August. Prof ANG Wee Han, Deputy Head (Administration and Student Life), gave an overview of the department and its programmes. Prof JIANG Donglin’s research talk covered Covalent Organic Frameworks (COFs) and Dr FOO Maw Lin gave a sample class on energy resources. This was followed by a visit to the materials chemistry research laboratories and a campus tour.

A delegation of three staff and 14 students led by Prof LU Jintao, School of Physics, Huazhong University of Science and Technology, visited the Department of Physics from 27 to 29 August. They had the opportunity to experience student life in NUS by attending lectures and guided tours of laboratories and research centres, as well as meeting Physics undergraduates.

Some 70 secondary students were challenged to visualise and explore how chemistry can be harnessed to address current and new challenges in a climate-impacted world at the Chemistry•Communication Challenge, based on the theme Chemistry Solutions for a Sustainable Future. The Raffles Institution Team beat 22 teams to emerge champions. This competition was a culmination of the week-long biennial Chemistry Week from 1 to 7 June, which also featured chemistry camps and workshops. It drew nearly 200 students from various schools in Singapore.

Participants of the Chemistry Workshop for Teachers, themed Colourful Chemistry in Classrooms, used materials from everyday life such as colourful vegetables, eggs and vinegar, in classroom teaching and experiments.

At the Chemistry Day Camp, a one-day non-residential camp, students immersed themselves in chemistry through hands-on laboratory activities and demonstrations.

Junior college students learnt about the synthesis of banana oil at the half-day Esterification workshop.
What’s Up? Check out the events from December 2019 to May 2020!

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