Launch of Science Merit Scholarship Initiative
Scholarships to draw talented students to study Science at NUS

Science Industry Day 2017
Diverse and exciting career positions and internship opportunities offered

Inaugural Internet of Things Datathon
Students develop data-driven applications to solve challenges faced by SMEs

Science Open House 2017
A day of discovering Science at NUS for prospective students

Faculty Awards 2016
Recognising faculty and staff who exhibit excellence in teaching, research and service

Fulfilling a Special Child’s Dream
Faculty names a scholarship after a child battling a serious disease

New Faculty Video
Visual showcase of our cutting-edge research and Transformative Science Education

STUDENTS
NUS Meets the Quant Challenge
Inaugural Entrepreneurs’ Talk
Playing and Studying Hard
Industry Sharing Series

RESEARCH HEROES
The Science Behind Our Scientists
University Awards 2017

DEPARTMENTS
Annual Teaching Workshop
The Art of Science Exhibition
Oppenheim Lecture 2017
NUSS Public Lecture by Prof Stephen J HAWKINS
BioBiz 2017
Inaugural National Pharmacy Residency Conference
Pharmacy Research Awareness Symposium 2017
Chemistry Laboratory Inaugural Winner in New BCA Scheme

OUTREACH
Inaugural Data Science and Analytics Day
Inaugural Teachers Workshop
Making Science Come Alive
Department Engagement Events
Mathematics Learning Journey

ALUMNI/FRIENDS
Science Alumni-Student Networking Evening 2017
TAN Ting Rei
Dr NEO Mei Lin
Department of Biological Sciences’ 20th Anniversary Alumni Reunion Dinner
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LAUNCH OF SCIENCE MERIT SCHOLARSHIP INITIATIVE

On 17 April, the Faculty of Science launched its Science Merit Scholarship initiative with a dinner attended by some 200 alumni, benefactors, corporate partners, students and staff.

This special occasion was graced by Guest-of-Honour President Dr Tony TAN Keng Yam, Chancellor of NUS, who is a Science alumnus. Also present were NUS President Prof TAN Chorh Chuan and Deputy President and Provost Prof TAN Eng Chye.

President Tony Tan had the opportunity to meet a group of 11 Science students, and briefly chatted with them.

At the dinner, Dean of Science Prof SHEN Zuowei spoke of the rapid technological changes and challenges of the Fourth Industrial Revolution which made the learning of science even more important.

He said, “Science graduates are particularly valuable in times of uncertainty and disruption. While technology can turn obsolete in the blink of an eye, the fundamental knowledge of science and attributes such as critical thinking, problem-solving and passion for discovery have enduring value.”

Prof Shen is the Co-Chair of the Science Scholarship initiative, together with Prof Leo TAN, Director of Special Projects at the Faculty. Prof Leo Tan also took to the stage with a rallying call to guests to support the building of an endowment fund that will provide scholarships to attract talented students with the aptitude and ability to study Science at NUS.

Prof Tan also emphasised that a donation was an investment in nurturing a young life. Explaining that students receive academic mentoring as well as emotional and mental support, he said, “University life is a sojourn and we prepare our graduates not just with professional or domain competence but also to aspire to live their lives meaningfully.”

Prof Tan also thanked the benefactors who had already contributed to the establishing of scholarships to kickstart the initiative.

Two students also shared on how NUS’ Transformative Science Education helped them to ignite their passion, hone their skills and fulfil their dreams.

Benjamin GOH, Year 4 Physics, and a Global Merit scholar, shared how he discovered his interest in communicating and explaining science and his experience working for a social start-up which specialises in
using animation as a pedagogical tool for public education in various topics such as diabetes disease management, biotechnology and even physics.

Samantha LAI, who was awarded the NUS Faculty Scholarship as an undergraduate, spoke on how the scholarship fuelled her passion in conservation during her studies at the Department of Biological Sciences (DBS). The scholarship enabled her to truly develop herself by opening doors to diverse learning opportunities. These opportunities, including a Student Exchange Programme to Sweden and an Undergraduate Research Opportunities Programme in Science (UROPS) project on reef corals, nurtured her interest in marine ecology and conservation. She is currently pursuing a Ph.D. after working for a few years at the National Parks Board.

Also present was retired Prof Dennis H. MURPHY, and many ex-students and friends who gathered to honour him with the establishment of a scholarship in his name.

Guests also enjoyed a performance by the BioEnsemble, a group of students and staff from DBS who regaled the crowd with two upbeat songs.

If you would like to make a gift towards the Science Merit Scholarship please click [here](#).

If you wish to find out more, please email Ms YONG Lai Cheng at sciylc@nus.edu.sg.

Click [here](#) to view the photo gallery of the Science Merit Scholarship launch dinner.
The industry fair featured more than 20 corporate partners.
The Faculty organised Science Industry Day 2017 on 17 March. This annual flagship event brings together students and corporate partners, and serves as a platform to exchange knowledge on the latest industry trends as well as career and advancement opportunities in diverse sectors.

The event comprised a series of industry talks, an industry fair featuring more than 20 corporate partners who engaged students and provided career advice at their booths, a workshop organised by the Pharmacy department and a ceremony where the winning teams of the inaugural Internet of Things (IoT) Datathon presented their prototypes.

The event gave students an eye-opening experience on the wide array of exciting career possibilities as well as corporate and research internship opportunities and graduate trainee programmes in various sectors. These included Government agencies, biomedical services, chemicals, education, financial services, infocommunications, manufacturing, retail and professional services, to name a few.

Close to 550 students participated in this year’s Science Industry Day, with approximately 200 participants at the industry talks and 80 participants at the Pharmacy workshop.

Pharmacy Workshop 2017

The Pharmacy department hosted a workshop on the topic “Solutions to Real-World Problems in Pharmaceuticals & Cosmetics”, where various industry speakers discussed innovative research in current pharmaceutical and cosmetics applications. Participants also gained insights on interdisciplinary research and how technologies are applied in industry.

The speakers included Dr George SHLIEOUT, Director and Head of Pharmaceutical Development and API Process at Abbott Laboratories; Dr NG Wai Kiong, Programme Manager for Cluster Development and Strategic Projects at the Institute of Chemical and Engineering Sciences, and Dr Parijat KANAUJIA, Scientist III at the Institute of Chemical and Engineering Sciences, A*STAR.

Dr Jaspreet Singh KOCHHAR, Senior Scientist at Proctor & Gamble's Singapore Innovation Centre and Ms Josephine LEE, Manager for Clinical Data Quality Managers and Clinical Trial Associates for Regional Clinical Operations for Asia Hub, Bristol-Myers Squibb Singapore, also shared on their experiences as NUS alumni.

This year’s workshop saw overwhelming participation from both undergraduates and postgraduates in the oral and poster presentations. Awards, including a certificate and a cash prize of $100 each, were given out to the best undergraduate oral presenter and the best undergraduate poster presenter, respectively. This year’s best oral presenter went to CHAN Yu Sen Alvin, a final year undergraduate student for his award-winning presentation entitled “Evaluation of flow and electrostatic properties of pharmaceutical powders”. LOW Mei Wen, also a final year undergraduate student, bagged the best poster award for her award-winning poster entitled “In vivo efficacy of phenylboronic acid-functionalised polycarbonate hydrogels for polymyxin B delivery”.

The Pharmacy workshop also showcased interesting displays of pharmaceutical technologies employed in schools and industries. Rapid prototyping by additive manufacturing or three-dimensional (3D) printing is increasingly finding its place in the domain of pharmaceuticals at an unprecedented pace. Intelligent 3D computer-aided designed models of hand models and drug delivery systems, such as 3D printed tablets and microneedles, were highlighted at the event. Techniques used in the fabrication of advanced drug delivery systems such as liposomes were also demonstrated for public viewing.

Inaugural Internet of Things (IoT) Datathon

A highlight of the event was the finale of the inaugural IoT Datathon, where the top four winning teams presented their solutions at a ceremony. The event, co-organised by the Faculty and Terra Weather, enabled students to transform their ideas into new data-driven applications for the IoT for small and medium enterprises (SMEs) under the mentorship of seasoned programmers and industry experts. The finalists then displayed their prototypes at an exhibition at the foyer of Lecture Theatre 28.

Click here to view the photo gallery of the Science Industry Day 2017.
As part of Science Industry Day 2017, the Faculty and Terra Weather, a Singapore-based weather technology company, co-organised the inaugural Internet of Things (IoT) Datathon.

The Datathon was a six-week event where NUS students were mentored by industry experts and seasoned programmers to develop new IoT data-driven applications that solve real challenges faced by small and medium enterprises (SMEs).

Through the competition, students gained technical skills by learning practical programming from scratch, problem-solving skills as well as exposure to Singapore’s entrepreneurial landscape. The event also opened up a diverse talent pipeline for local SMEs.

The Datathon drew 69 teams, who were presented four problem statements facing companies in the sectors of healthcare, clean energy and smart technologies.

To enhance operational efficiency in the healthcare industry, participants were tasked to develop an intelligent system to provide healthcare advice based on patients’ demographics, financial status and medical history. The teams were mentored by Dr TAN Jit Seng, CEO of Lotus Eldercare, an SME which leads in IoT-related projects for Singapore’s growing silver population.

Dr Tan also oversaw a second project, where teams were guided to develop cloud-based matchmaking applications to facilitate the buy-back of hospital furniture.

In another project, teams were challenged to develop predictive maintenance algorithms for photovoltaic systems by establishing reliable real-time data monitoring and developing alert mechanisms on potential failures. They were mentored by Mr HO Chee Ming, Technical Director of Energetix, which designs and installs solar photovoltaic systems in the region.

Other teams were tasked to develop applications to test and enhance optical character recognition capabilities. They were mentored by Dr SUN Guo Hua, Technical
Director of Jing King Tech Holdings, which develops biometric and automated solutions for industries.

The winning team, Sababa, developed an algorithm that automates the predictive maintenance of a solar photovoltaic system by analysing data from the inverters. It flags potential failures in advance by recognising the root causes, thereby reducing downtime and costs.

Team Sababa’s Kenny CHONG, Year 4 Physics, said, “We learnt to be flexible and adaptable. Our initial model was very different from our final product. After wrangling our datasets, we discovered new insights and improved our models.” Another Team Sababa member LIU Nairong, Year 4 Statistics, said, “Working on real-life datasets provided great insights on data analytics work.”

Mr Ho of Energetix said, “We were impressed by the teams’ enthusiasm and the solutions they came up with in such a short time.”

Mr Arnold DORAY, Managing Director, Terra Weather, said, “The Datathon connected SMEs with talented students from Science, Engineering, Business and Arts. Students learnt about business and technology and what makes a successful real-world product.”

On Demo Day on 11 March, teams presented their ideas to judges and companies that were seeking to recruit talent.

Judges from NUS, Terra Weather and event partners selected winning solutions through a rigorous judging process.

HIGHLIGHTS

Winning team Sababa presented their solutions at an exhibition on 17 March.
SCIENCE OPEN HOUSE 2017
The Faculty of Science campus was bustling with close to 1,000 prospective students and their parents at its annual Open House on 13 May.

The full-day event featured Master Classes by award-winning professors, sharing sessions by current students and alumni, informative programme talks, student activities as well as guided tours to the Faculty’s key facilities and state-of-the-art laboratories. These activities provided an insightful glimpse into the depth and diversity of the learning experiences offered by the Faculty, including academic programmes, overseas opportunities, student activities, internships and residential life.

In his welcome address, Dean of Science, Prof SHEN Zuowei shared how NUS’ Science education prepares students to be future-ready amidst technological change. He said, “The Fourth Industrial Revolution means that the study of science has to cross disciplinary boundaries. Our Science curriculum is designed to provide students the freedom to explore and discover their strengths and interests.”

Prof GOH Say Song, Vice Dean for Outreach and Admissions, then elaborated on the future-ready skills students could acquire through studying at NUS Science, the achievements of some of our young and established alumni and the varied career opportunities for graduates.

At the well-received interactive session, four Science undergraduates from different disciplines and backgrounds shared why they chose NUS Science, their experiences here and their future plans.

**Students and Alumni Interactive Session**

- **Fazrina SALAUDDIN**, Year 2 Statistics: “The flexible curriculum gives us the opportunity to explore different majors and modules offered in NUS.”
- **ANG Shi Hui**, Year 3 Life Sciences: “The Special Programme in Science improved my communication and organisational skills.”
- **Benjamin GOH**, Year 4 Physics: “The Minor in Pharmaceutical Sciences broadened my horizons and opened up more career options.”
- **Benson CHONG**, Year 4 Chemistry: “I gained insights into the working life of a forensic scientist through laboratory analysis on real-life forensic evidence at a student exchange programme at the University of Toronto.”
- **Dr LOKE Chok Kang**, B.Sc. (Hons) in Statistics and Applied Mathematics (2005), Ph.D. in Statistics (2012): “Data analytics can be applied in different domains. You will be well sought-after with an NUS education.”
- **Dr Edwin YANG**, B.Sc. (Hons) in Life Sciences (2010), Doctor of Medicine (2016), Duke-NUS Graduate Medical School: “NUS Science provides broad-based training which can be applied in different domains and industries.”
Science Open House 2017 Experience

For the first time, this year’s interactive session featured alumni sharing. Statistics and Applied Mathematics alumnus Dr LOKE Chok Kang, Principal Analyst (Human Resource Intelligence), Strategic Planning and Research, Public Service Division, Prime Minister’s Office and Life Sciences alumnus Dr Edwin YANG, Doctor, Ministry of Health Holdings Pte Ltd (Singapore) and Resident, General Surgery, Singapore Health Services (SingHealth), shared on their career development and offered valuable advice to prospective students on making the most of their undergraduate experience and preparing for a career.

The visitors had a sample of some of our exciting courses and experienced firsthand how lectures are conducted at the Faculty from the popular Master Classes and the academic talks by faculty members. One student said, “The Master Classes are useful as I get to experience the lectures before my enrolment.”

The student societies’ booths showcased a host of exciting student activities and featured various hands-on activities, such as fingerprint dusting and lifting activities at the Forensic Science booth, Sudoku puzzles and Rubik’s cubes at the Mathematics booth, invisible ink exhibits at the Chemistry booth and Statistics’ interactive decryption game.

Science Club RAG dancers pumped up the atmosphere and vibrancy with snippets of the spectacular dance performance that earned them the Gold Award at RAG 2016.

A selected group of alumni and their families were also invited to attend the Open House talks in appreciation of their contributions to, and support of, the Faculty. A lunch hosted by the Dean and a tour to the Lee Kong Chian Natural History Museum was specially arranged for them.

Pharmacy alumnus Dr KANNEGANTI Prasad: “I was impressed with the many parallel sessions which focused on specific topics of interest and I enjoyed discussions with other attendees on how our graduates are building their careers.”

Pharmacy alumna speaker Ms Joyce LIM, Head of Marketing, Pharmaceuticals, Johnson and Johnson: “The comprehensive programme gave a good glimpse of what the Pharmacy course entails as well as the career options for graduates.”

Food Science and Technology (FST) alumnus speaker Dr Gabrielle KOH, Assistant Head (Food, Nutrition and Consumer Care Cluster), Biomedical Research Council, A*STAR: “This meaningful event gave me the opportunity to reach out to new FST students and to share my experience.”
Award-winning professors gave insights into various enrichment courses.
Guided tours to the Faculty’s key facilities and state-of-the-art laboratories
The annual Faculty Awards Ceremony was held on 20 January. It recognises faculty and staff who have excelled in the areas of teaching, research and service. Prof HO Teck Hua, Deputy President (Research & Technology) and Tan Chin Tuan Centennial Professor, was the Guest-of-Honour. The ceremony was held at the Platypus Food Bar@NUS. Life-sized standees of recipients of the Honour Roll, Outstanding and Young Scientist, as well as 45-year Long Service Awards were displayed at the Science Lobby. Alongside the standees were banners of recipients of the Faculty Teaching Excellence, Teaching Assistant, Outstanding Service and Commendation Awards.

In his opening address, Dean of Science, Prof SHEN Zuowei, highlighted how the use of innovative pedagogy, such as technology enhanced education, has allowed students to develop and nurture creative and critical thinking.

Exemplifying the spirit of excellence cited by Prof Shen, the Faculty Teaching Excellence Awards (FTEA) recipients are nominated by their students and peers for their dedication to, and efforts in teaching. For instance, a student of one of the award winners, Dr WU Jinlu from the Department of Biological Sciences, said, “Dr Wu is an extremely dedicated lecturer who puts in a lot of effort to prepare his lessons. He uses visual aids and live demonstrations to help us understand the concepts.” This year, there were 19 FTEA recipients. Some FTEA recipients were subsequently placed on the Honour Roll for their sustained high performance in teaching. This year, Dr Adrian Michael LEE from the Department of Chemistry, as well as Prof Phil CHAN and Prof TAY Seng Chuan from the Department of Physics received the Honour Roll awards.

Next was the Teaching Assistant Award, which recognises outstanding Teaching Assistants for their dedication and commitment in teaching. There were eight full-time and 10 part-time winners this year.
Prof Shen also shared on how our researchers have made significant and impactful progress. He said, “Their discoveries have enhanced human understanding of nature and moved forward the frontiers of scientific knowledge. Their work is increasingly translated into practical solutions that advance technology.”

Prof GONG Jiangbin from the Department of Physics was one of the Outstanding Scientist Award recipients who has a consistently strong research track record in his area of expertise. He has made a long list of original and impactful theoretical discoveries in quantum control with many of them demonstrated experimentally. The other recipient, Prof ZHANG De-Qi from the Department of Mathematics, has published many impactful papers in reputed journals like Algebraic Geometry and has presented at various international conferences.

This was followed by the Young Scientist Award, which is conferred to researchers below 40 years of age based on the potential impact in their respective areas of research. This year, there were two recipients. Within his short time at the Department of Biological Sciences, Dr Frank Erwin RHEINDT has established an extensive research programme on population and conservation genetics as well as biodiversity research. The other recipient, Dr Utkur Mirziyodovich MIRSAIDOV from both the Department of Biological Sciences and the Department of Physics, has set up a programme on direct visualisation on nanoscale processes in Singapore.
This year, 11 staff received the Outstanding Service Award in recognition of the exemplary service they rendered. Mdm ANG Hwee Hiok from the Department of Chemistry received the Commendation Award which recognises support staff who received compliments for their performance over the years and who went beyond the call of duty to serve the department and Faculty.

Last but not least, the Faculty paid tribute to individuals who had crossed a significant milestone in their respective careers, and in the process, contributed years of continuous and loyal service. There were 113 Long Service Award recipients, with two recipients from the Department of Physics who celebrated 45 years with the Faculty.
The dream of a child battling a life-threatening disease became reality with the support of the Faculty of Science.

On 17 January, the Faculty organised a special visit to the Lee Kong Chian Natural History Museum for five-year-old Aiman, who loves animals, especially dinosaurs. Aiman, the only child of Mr Hafiz HAMID and Mdm Syahirah SA’ID, has been diagnosed with end-stage Glioma Pontine, one of the most devastating pediatric cancers.

Aiman was Given a special tour of the museum, where he came up close with a trio of 150-million-year-old diplodocid sauropod dinosaur skeletons. Aiman, who developed his love for dinosaurs from watching National Geographic programmes, knows the names of many dinosaurs. His favourite is the famous Tyrannosaurus rex.

Aiman was accompanied by his mother and grandmother, 20 children from Arc Children’s Centre, their teachers and caregivers. He was welcomed by donors, notably Dr Maliki OSMAN, Senior Minister of State for Defence and Foreign Affairs, and his wife Mdm Sadiah SHAHAL, Aiman’s language teacher and a volunteer at Arc Children’s Centre.

The children were also treated to a tasty lunch at the Learning Laboratory which was transformed into a play area with colourful balloons. The children sang Aiman’s favourite songs, “Peng You” (Friends) and “Top of the World”. Just as they finished their lunch, the children were surprised as a dinosaur walked menacingly into the room. Initial feelings of shock and fear at the sight of a walking dinosaur turned into playful squeals and laughter as the children approached the fearsome creature to touch it. At the end of the visit, each child was given a dinosaur goodie bag filled with treasures that would help them remember this visit for a long time to come.

Despite his illness and his inability to walk, Aiman was all smiles and cheerfully chatted with his friends during the visit. When asked how he was feeling, Aiman

Fulfilling a Special Child's Dream
Prof Roger Tan, Vice Dean (Education and Special Duties), Faculty of Science, presented Aiman with a specially designed placard carrying Aiman’s named scholarship. He said, “We are pleased to bring a wonderful experience to this incredibly brave child. We hope that the special visit will create lasting happy memories for Aiman and his family.”

The visit to the museum was made even more significant with the announcement that the NUS Science-Aiman Merit Scholarship was created in recognition of the courage and resilience shown by Aiman and his family in the face of overwhelming difficulties. The scholarship, made possible by the generous contributions of Aiman’s well-wishers who altogether pledged more than $75,000, will enable a deserving student to pursue a Science education at NUS.

Dr Maliki Osman had an enjoyable chat with Aiman.

said, “I am happy. I am not tired. I love the dinosaurs.”
The Faculty’s new corporate video is a visually impactful illustration of how we leverage on our strengths in cutting-edge research and transformative science education to Stay Ahead of the Future.

The first scene showcases how our diverse programmes and innovative teaching pedagogies equip students with domain knowledge and life skills. Through industry-relevant educational programmes, Study Abroad programmes which offer students world-shaping experiences and internships with real-world exposure, the Faculty grooms graduates for the careers of tomorrow.

Snapshots of our award-winning professors, world-class research infrastructure, strong collaborations, international immersion of students and a dynamic community of students and professors, show how the Faculty’s research benefits society, in Singapore and beyond. By transforming scientific thinking in important areas, the Faculty is at the forefront of pressing challenges—sustainable development, the fight against diseases, the search for new materials or new disruptive technologies that are transforming economies.

Snippets of invigorating student activities illustrate how learning and discovery take place in a vibrant campus where students are empowered to take charge of their learning journeys. The video concludes with a montage of alumni, who have distinguished themselves as business leaders, educators, researchers or entrepreneurs.

Click here to view the video.
The first NUS Quant Challenge, sponsored by US-based quantitative asset management firm WorldQuant, LLC, attracted 50 teams interested in developing alphas – mathematical models that, when used in combination with historical data, seek to predict future movements of securities and various financial instruments.

Hosted by the NUS Faculty of Science and School of Computing, the Challenge saw teams of one to four members – some 150 students in total – compete by building alphas and working to obtain the highest aggregated score.

The NUS Quant Challenge was an intensive experiential learning event held over a two-week period, with a particular focus on teamwork between students exclusively from NUS. Hands-on training and Q&A sessions were held at specific stages of the competition, through the collaborative efforts of the Faculty and WorldQuant’s Singapore and Vietnam offices. Students were educated on how to build alphas and use Websim, WorldQuant’s proprietary web-based simulation platform. Additionally, the competition’s kick-off event on 25 March included an insightful four-hour training session by Mr Jeffrey SCOTT, Director of WorldQuant’s Virtual Research Centre, and Mr Nitish MAINI, Vice President of Portfolio Management.

With students coming from diverse STEM backgrounds, the Challenge was an excellent way to build a bridge between the students’ skill sets and quantitative finance. Dr Murugesan SETHU, the Faculty’s Head (Strategic Partnerships and Development), said, “The Challenge provided students of different disciplines the opportunity to apply their quantitative way of thinking and creativity in investment strategies.”

The overall winner of the NUS Quant Challenge was the Quant Rangers, a team comprising two students from the Department of Mechanical Engineering and the Department of Mathematics’ Quantitative Finance programme.

HU Bing from the winning team felt that “intellectual curiosity and diligence” enabled the Quant Rangers to stand out in the competition, and that the experience allowed him to build on his financial knowledge from knowing “simple finance jargon to complicated quantitative modelling”. Ultimately, students had the opportunity to innovate and familiarise themselves with quantitative finance tools that many of them will encounter in the future.
The Entrepreneurs’ Talk is organised by the NUS Students’ Science Club Business Sub-Committee to promote the spirit of entrepreneurship amongst NUS Science students. The talk also provided a platform for undergraduates to network with the speakers, who shared on the challenges, opportunities, trends and developments in the entrepreneurial community.

The inaugural session of the talk was held on 17 February. Alumni with previous entrepreneurial experience, or who are currently working in start-up companies, were invited to share their insights and personal experiences as entrepreneurs.

Life Sciences’ alumnus Shamir RAHIM, who founded Sypher Labs Pte Ltd in 2012, shared how his company’s flagship product VersaFleet™ revolutionises logistics with cloud technologies, offering quicker and more reliable order fulfilment with real-time visibility. He also discussed the opportunities provided by the Government to encourage more start-ups in Singapore.

He said, “It was exciting to see that the students were interested in the topic of entrepreneurship.”

Chemistry alumnus Joey WANG shared on the qualities and attributes of successful entrepreneurs. Joey founded Appiloque Pte Ltd, a digital marketing agency that specialises in search engine marketing and social media marketing.

Mathieu FRANÇOIS, a graduate of the Nanyang-Waseda Double Masters programme, co-founded Epigami, an online education company which provides a Business-to-Consumer marketplace for private tutors and online services for tuition centres. He discussed whether entrepreneurs are born or nurtured and how his educational and career journey in the technology sector shaped him to become an entrepreneur.

He said, “Such sharing sessions are useful to enthuse aspiring young entrepreneurs to take a leap of faith to start up their own businesses.”

Chris XUE, a Business Administration (Accountancy) graduate who just started his own business, shared his views on what makes one suitable to become an entrepreneur.

TANG Jun Rong, Year 2 Chemistry, said, “The talk made me ponder the possibility of becoming an entrepreneur. How we seize opportunities that come our way is what makes the difference.”

BAY Min Hwee, Year 2 Chemistry, the NUS Students’ Science Club Business Sub-Committee Director, said, “It is great to know that Science students are prepared to venture beyond their books, and to dare to be different and innovative.”

Students had the opportunity to interact with the speakers after the talk.
The NUS Students Science Club organised a range of activities, including volunteerism and sports, where students came together for fun and bonding. Science Day 2017 on 20 January was an exciting and eventful one. The booth was colourfully decorated to illustrate the event theme, “Nostalgia”. Participants engaged in popular traditional games such as Snap, eraser flipping and five stones. To add a twist to the activities, participants were tested on their biology and life sciences knowledge before the games started.

V. MITHEERA, Year 2 Life Sciences, said, “I had fun meeting other students and forming new friendships as we made a trip down memory lane playing eraser wars and Snap.”

CHANG Jingkai, Year 1 Life Sciences, said, “The Faculty’s passion and zest in celebrating the event was refreshing and infectious.”
Science Sports Games (SSG) 2017, a sports competition for Science students, staff and alumni, was held on 18 February. The event seeks to build teamwork among participants through sports.

SSG 2017 featured futsal, basketball, dodgeball and Captain’s ball, as well as basketball and football matches where Inter-Faculty Games (IFG) alumni teams played with current IFG teams. In addition, SSG this year included three non-competitive games, namely bubble soccer, laser tag and IDARTS.

L.E.G.O. (Loving, Enriching, Giving, Outreach) Week, held from 6 to 10 March, featured different themes which guided the day’s activities, like penning appreciation notes for school cleaners and construction workers on the day of ‘Loving’, or setting up a collection drive to support ‘Giving’.

JOW Cer Lin, Year 2 Chemistry, said, “I was amazed by the students’ dedication in creating opportunities for others to give back to the community in any way they can. This prompted me to do my part in various volunteering initiatives organised in Science.”

Little MARCHallers is an annual learning journey organised by the NUS Students’ Science Club Science Volunteer Corps (SVC) to generate interest in Singapore’s biodiversity and environmental conservation amongst primary school children. This year, 10 beneficiaries from the Young Women’s Christian Association of Singapore were invited for an educational tour to the Lee Kong Chian Natural History Museum on 1 April. The children were tasked to complete an activity book and were awarded “Little MARCHaller” badges.

LI Lingshi, Year 2 SVC member, said, “Despite their diverse backgrounds, the children showed great desire to learn about our natural heritage.”
IllumiNUS, an overnight cycling event, was held on 13 to 14 May. The route, featuring numerous food stops, started from East Coast Park and continued to Paya Lebar Supper Club, Swee Choon at Jalan Besar Stadium and Akbar at Shenton Way, ending with sunrise watching at Marina Barrage.

Clymene LIM, Year 3 Life Sciences, Acting Sports Director, said, “This fun event is intended to forge friendships and promote a healthy lifestyle through sports. Participants also learnt about safe cycling routes in Singapore. We hope that the participants enjoyed it as much as we did.”

ALIVE! (Appreciating Lives, Initiating Volunteerism Everyday!) 2017, held on 29 May, revolved around the theme “Familia Ante Sanguine”, or “Family Beyond Blood”. The event sought to nurture family-like bonds between student volunteers and beneficiaries and to promote understanding that family can extend beyond blood relatives to members of the community.

Volunteers worked with children from the Young Women’s Christian Association of Singapore and Fei Yue Student Care Services and elderly beneficiaries from the Caregiving Welfare Association to solve riddles and play table games, where they earned currency for recyclable materials to decorate their own windmills and towers. ALIVE! 2017 concluded with a “Family Tree” segment where participants pasted leaflets with their thoughts on family onto a tree structure.
Terra Weather

On 6 February, Mr Doray, a Physics alumnus, shared on Terra Weather’s success story, notably how technological innovation enabled a small company to compete with multinational corporations. With over 20 years’ experience in the technology sector, Mr Doray spoke with conviction on how digital technologies can drive business efficiencies. Attendees also learnt about the inaugural Internet of Things (IoT) Datathon 2017, where students could work with small and medium enterprises (SMEs) to develop data-driven applications based on real-life problems.

The Nielsen Company (Singapore)

On 13 February, Mr Timothy BANKS, Director of the Singapore Data Science (Methods) Innovation Lab, and Mr LIM Chong Jie, Data Scientist and a Mathematics and Statistics alumnus, shared their perspectives on data analytics and its applications in the global communications and measurement industry. Mr Banks provided an overview of the top three trending programming languages used by data scientists, as well as how data scientists deploy diverse skills like programming and knowledge of databases and visualisation tools, in their work.

Mr Lim went on to describe key skills and attributes to be a data scientist, such as the ability to challenge assumptions and the importance of continual learning for skills upgrading. With these skills, data scientists can effectively serve multiple roles as data processors, data conditioners, data miners, researchers and innovators.

Works Applications

At his session on 27 February, Mr Miyamoto shared his belief that graduates with business domain knowledge but without computer science training can nevertheless enjoy successful careers in the technology business-to-business sector. He went on to explain how organisations can use artificial intelligence to improve business efficiency.
The Alumni-Student Networking Evening 2017 was held on 10 March.

A total of 85 Science undergraduates participated in this event organised in collaboration by the Faculty of Science and the NUS Students’ Science Club Alumni Relations Sub-Committee.

12 alumni mentors from various industries and majors were invited, and they shared their career experiences and interacted with the undergraduates during the networking session held after the panel.

At the panel session, students had insightful discussions with the alumni on interview techniques, career progression, as well as their career aspirations and dream jobs. The alumni also shared with the students on how to stand out during interviews and how some companies conduct headhunting through LinkedIn profiles.

Professional headshot and make-up services were provided to the students to enhance their image for their resumes and online career profiles.

The event was well-received, with positive feedback from various participants.

CHUA Wei Jie said, “I enjoyed the sessions! Cassandra from Food Panda gave me new insights about how the working world is like.”

Jeslyn LEE Chun Wei said, “I was unsure about my future path but through the networking session, I learnt of the alumni’s experiences which resonated with me. Their sharing also helped dispel my fears and encouraged me to explore my interests.”

Samantha ONG Kah Ling said, “Talking to alumni from different fields encouraged me to be venturesome instead of limiting my options.”

From left: Alumni Ms Joyce Fu, Mr Aaron Tan, Dr Victor Sim, Mr Low Lerh Feng, Mr Bryan Leong and Mr Fung Fun Man shared their work experiences at the panel discussion.
A research project on quantum entanglement by TAN Ting Rei, a Special Programme in Science (SPS) alumnus who graduated with a B.Sc. (Hons) in Physics (2009), was selected by the Institute of Physics, a leading scientific society in the United Kingdom and Ireland, as one of the top ten physics breakthroughs of 2016.

Ting Rei worked with Prof David J WINELAND, a Nobel Laureate physicist (2012), at the National Institute of Standards and Technology in Boulder, Colorado, to create and measure quantum entanglement between two different types of ion for the first time.

Ting Rei said, “It was a great honour for me to learn and conduct research under the guidance of the best scientific minds. This experience fulfills my dream as an experimental atomic physicist.”

The research team used two sets of laser beams to entangle the two ions of different species, enabling them to establish a special quantum link between their properties and to provide a complete set of quantum gates which can perform any possible computation using ions of multiple species.

The research could pave the way towards practical quantum computers, as the new mixed-species gates can serve as an important building block for quantum networks. Quantum computers could solve some problems which cannot be solved even with today’s most powerful supercomputers, such as breaking the best data encryption codes.
Dr NEO Mei Lin, marine biologist and Research Fellow at St John’s Island National Marine Laboratory and the Tropical Marine Science Institute, NUS, is the only Singaporean to make the prestigious TED Fellow list this year. Mei Lin graduated with a Bachelor’s Degree in Life Sciences and a Ph.D. in Biology.

Since 2006, Mei Lin has studied giant clams - the world’s largest bivalves. These legendary creatures, which can measure up to 4.5 feet across, weigh up to 550 pounds and can live up to 100 years, are a prized seafood delicacy. Fossilised giant clams are also popular as carving material. As a result, coral reefs are being mined and destroyed in the process.

Mei Lin has identified giant clams as playing a key role in coral reef ecosystems, as providers of food and shelter and as water filters. She led Singapore’s giant clam restocking and conservation programme in 2011 which has since seen cohorts of juvenile fluted giant clams transplanted onto coral reefs across some of the southern islands.

As a TED Fellow, Mei Lin joined the likes of technology giant BILL GATES and former United States Vice President AL GORE in having her own TED talk in Vancouver, Canada, in April 2017, where she shared on the importance of marine conservation.

She said, “It was an invaluable opportunity to spread my idea on how saving giant clams can save coral reefs too. I hope to synergise conservation research and science communications to help save them from the perils of today.”

The TED Fellows programme brings together young innovators across disciplines and it has created a far-reaching network of scientists, doctors, activists, artists, entrepreneurs, inventors, journalists and more.

Mei Lin’s latest accolade builds on her notable achievements, which included the L'Oréal-UNESCO For Women in Science National Fellowship (2015) and a spot on Forbes’ 30 Under 30 Asia list (2016).

Dr Neo Mei Lin was presented a shirt by TED Fellows Programme Director Mr Tom Rielly with the witty catchphrase from her talk - “It's a CLAMITY!” [Photo: Ryan Lash / TED]
The Department of Biological Sciences (DBS) celebrated its 20th anniversary on 10 March at the NUSS Guild House. The Classes of 1995 to 1997 were invited to an inaugural alumni reunion dinner as part of the celebration. The reunion dinner was attended by 49 alumni and 10 former faculty members, many of whom had not seen each other since their college days.

Long-time professors, Prof Alex IP and Prof TAN Teck Koon, recounted the wonderful memories they had with their students. Several alumni also went on-stage to share interesting stories about their undergraduate days. It was a memorable evening for everyone as they reconnected with old friends and reminisced about their shared experiences in the past.

Alumnus Mr Daniel CHUA, Class of 1995, Teacher Mentor, Raffles Institution:
“I am from the first cohort of DBS students. It’s been 20 years since I graduated. I thank this bunch of friends who made my four years here memorable and Prof YEOH Hock Hin for your guidance.”
Prof Prakash KUMAR: “The reunion gathering was a wonderful opportunity to catch up with our senior colleagues and former students who are pursuing various careers. I hope that we will have such gatherings regularly to renew the bonds between the alumni and our department.”

Alumnus Mr Eric LAM, Class of 1997, Chief Executive Officer, Amdon Group of Companies: “It was wonderful meeting with all the professors after all these years! I look forward to more alumni gatherings and to help out where we can to inspire the younger ones!”

Prof DING Jeak Ling: “We celebrated the homecoming of our senior colleagues and welcomed back our alumni of Class 1995 to 1997. It was very heartwarming to note how successful our graduates are.”

Prof TAN Teck Koon: “It was a joy to meet up with our former students who are now doing well in their lives and professions. Listening to their reminiscences of their happy student days brought back warm memories and I couldn’t help feeling a tint of patriarchal pride in seeing how they have bloomed.”
Prof WONG Sek Man: “Teaching is rewarding. Adrian LOO was inspired by a slide shown during Prof Hugh TAN’s lecture that made him decide to become a botany researcher. Although Prof Tan was not present at the dinner, I am sure he would feel gratified that he inspired someone in the next generation to share the same passion and to pursue a career in the same field of study.”

Prof Alex IP: “This homecoming event served as an important platform to reconnect old friends, build networks and update our alumni on developments in the department. More importantly, it was a very happy reunion. I met up with former students and senior colleagues who had retired and together, we took a trip down the memory lane of nostalgia. The memory of our friendship is a great treasure, and I look forward to participating in the next reunion event.”

Dr KOH Tong-Wey: “Thank you for the wonderful reunion evening.”

Alumna Ms Jacqueline LIM, Class of 1997, Senior Manager, Health Food & Dining, Obesity Prevention Management Division, Health Promotion Board: “It was a reconnection with long-lost classmates and well-respected professors. A toast to another 20 years of friendship!”
On 4 May, the Faculty organised an inaugural gathering of class ambassadors, held at Awfully Chocolate, a successful chocolate retail and food and beverage business co-founded by NUS alumnus Ms Lyn LEE.

Following up on NUS’ Office of Alumni Relations (OAR) Class Ambassador Investiture, the gathering welcomed the newly appointed 2017 class ambassadors. The initiative is part of the Faculty’s efforts to build a strong alumni network.

Through the event, alumni are kept informed of the latest news and developments in the Faculty and NUS. It is also a platform for class ambassadors to interact and reconnect, as well as to share their experiences as undergraduates and at the workplace.

The Class Ambassador gathering was attended by 20 Science alumni. Among them were Mr Renny CHONG, Statistics alumnus (Class of 2012) and Fundraiser, The Abraaj Group; Mr Bryan LEONG, Life Sciences alumnus (Class of 2009) and Senior Medical Representative, Boehringer Ingelheim; and Ms Clara MIRALDI, Food Science and Technology alumnus (Class of 2017) and Assistant Director, PT. Reka Inti Chatura Hasta.

Since 2008, the Class Ambassador programme supported by OAR has played a vital role in building a strong alumni community.
More than 70 Science alumni attended three sessions of a specially organised Single Mingle workshop on 27 and 28 May. With a twist from previous years’ programmes, the event was transformed to a series of workshops to enable alumni to interact more closely through meaningful activities.

The workshop started with some interactive games which served as ice-breakers to introduce the alumni to one another. This was followed with an art jamming session that facilitated conversation. Ending on a sweet note, the alumni were encouraged to do a postcard exchange with each other.

One of the participants, Mr TEE said, “The event was exciting, interesting and well-organised with interactive activities. We made several new friends and headed off for dinner together after the workshop.”

The event was co-sponsored by the Social Development Network to offer Science alumni a platform to widen their social circle and reconnect with their friends.
The Faculty of Science 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.

Some of our researchers share their achievements, the challenges and rewards of their work and their plans moving forward.
Prof GONG Jiangbin
Department of Physics

"I was driven by curiosity to venture into this field. Many quantum-based technologies are starting to change our daily lives. However, even the most powerful computers today cannot run a precise quantum simulation of how a small system of only tens of atoms evolves with time. Yet Nature accomplishes this effortlessly.

I study theoretical aspects of quantum dynamics but I value experimental demonstrations. There is always a sense of achievement when my theoretical work materialises in a laboratory.

In 2001, I published a theoretical finding on the possibility of coherence-based quantum control in a classically chaotic system. This was confirmed by an experimental group 16 years later. In 2015, my students and I made a remarkable finding on how quantum coherence may generate an unusual correction to the seminal Thouless pumping that connects mathematical concepts to physical observations. A wonderful experiment in full agreement with our theory was carried out within two years from our theory.

The key challenge is to identify a sustainable research direction that is distinctively different. Open-mindedness, the willingness to step out of our own comfort zone and a passion for knowledge are necessary to meet this challenge.

While the relevance of my research to real-life applications is perhaps too remote to see, I derive great satisfaction when my research uncovers previously unknown phenomena and spurs others to delve into it further. The biggest reward is to work with young talents, to help them discover their research strengths. You never know, someone I taught or supervised might find his or her dream from me.

A successful research journey needs strong support from family and colleagues. We need to constantly acknowledge our own limitations and keep learning."

Prof Gong has made a long list of original and impactful theoretical discoveries in quantum control, with many of them demonstrated experimentally. One of his achievements includes the discovery of particle-number-dependent control of quantum tunnelling in a quantum many-body system. This work was published in Physical Review Letters 2009, a top journal, and has been cited more than 75 times. Prof Gong's research garnered him the Institute of Physics Singapore World Scientific Award 2017, National Research Foundation Investigatorship Award 2017 and Faculty of Science Outstanding Scientist Award 2016.
I have always been fascinated by the way Nature builds things. To understand this process and the assembly of complex materials from seemingly simple and small nanoscale building blocks, we need to observe these processes in real-time and learn from Nature. Today, using advanced electron microscopy techniques, we can directly visualise how materials form and behave with atomic precision.

Our research aims to understand the mechanisms that govern the synthesis of new nanoscale materials for applications in nanoelectronics and catalysis. Most of the processes that are relevant to the synthesis of new materials are very dynamic and occur in liquid or gaseous environments. Currently, we study these nanoscale dynamic processes in liquid environments using in-situ Transmission Electron Microscopy developed at NUS.

The topics I study are fundamental to many technologies that surround us. Some of our projects can potentially impact the way next generation microelectronics devices are engineered in the near future. Better materials mean better technologies. Systems comprising many or few atoms give rise to many unique material properties, and these materials with engineered properties enable us to build computers that store and share huge amounts of information. This will change the way we communicate.

Our field is multidisciplinary and the main challenge is that the questions we ask require expertise in various disciplines such as microscopy, physics, chemistry, materials science, data science, and electrical engineering. I am blessed to have great colleagues and collaborators within different fields with whom I can have very illuminating discussions.

I mentor some of the brightest young minds. Watching my students mature into great scientists is very rewarding.
The University Awards 2017 ceremony was held on 28 April.
The Awards celebrate the accomplishments of our talented professors.
Their work has set new benchmarks in education, research and service and contributed
to the advancement of research and Singapore’s progress.
Dr Adrian Michael LEE is a pioneer in technology-enhanced education. He implemented the flipped classroom pedagogy which features online lectures and quizzes, narrated screencast solutions to problem sets, individualised homework assignments, and reimagined classroom time that focuses on active learning.

He also developed the Integrated Chemistry Laboratory Manual, a collaboration with the Centre for Instructional Technology that prepares students for laboratory classes through multimedia.

He said, “The ubiquity of technology in the modern world obliges educators to integrate technology into the education of our students.”
Prof LIU Xiaogang, Department of Chemistry, is internationally recognised for his groundbreaking multidisciplinary research in optical nanomaterials and energy transfer, including the novel use of luminescent nanocrystals for photocatalysis, sensing and biomedical applications. His most recent research breakthrough is on the development of upconversion nanomaterials as next-generation bioprobes for the tracking of cancer cells and other bioimaging applications. His research has the potential to significantly improve the way scientists study biological systems and control neuronal function.

Prof Liu has garnered numerous accolades for his scientific achievements, including the 2016 President’s Science Award from A*STAR. In 2015 and 2016, Thomson Reuters named Prof Liu among the world’s most influential scientific minds. He said, “Being a researcher requires inspiration, imagination, a lot of small innovations and not settling for mediocrity. It is important to recognise the benefits of failure, knowing that a new opportunity is beginning.”
Prof Leo Tan Wee Hin, the Faculty’s Director (Special Projects), has contributed significantly to general science education in Singapore. He brought about transformational changes as Director of the National Institute of Education (NIE), by championing educational reform in teacher education, school leadership and content and pedagogical research. He played an instrumental role in growing NIE into an internationally acclaimed institute of education for teachers.

As Director and CEO of Science Centre Singapore, he revolutionised the Centre into a vibrant institution for disseminating knowledge in science and technology to students, teachers and the community. This was done through skilful packaging of scientific concepts made comprehensible to the public.

Prof Tan played a pivotal role in the establishment of the Lee Kong Chian Natural History Museum. He supervised all aspects of the project, including fundraising, as well as design and relocation of the existing collection from the former Raffles Museum of Biodiversity Research.

As a passionate advocate for the environment, he championed Encyclopaedia of Singapore Biodiversity, a seminal compendium of the nation’s biodiversity, and secured $1.2 million in donations.

During his term as Chairman of National Parks Board, the Gardens by the Bay was initiated. He is a Board Member of Mandai Park Holdings, which oversees the development of a new eco-attraction for Singapore.

He said, “I believed that NUS would one day be counted among the world’s best. That faith was well placed. Today, I am justifiably proud to be an alumnus of NUS.”
The panellists shared their insights and addressed queries raised by the attendees. From left: Prof Lita Chew, Prof Chng Huang Hoon, Prof Goh Say Song, Dr Sirinut Sawatdeenarunat and Prof Yap Von Bing.

Annual Teaching Workshop
The Faculty organised its annual teaching workshop on 17 April, the third in a series of workshops on developing students’ life skills. In support of the theme, “Enhancing Skills for Lifelong Learning”, the workshop featured NUS’ various initiatives to inculcate lifelong learning among students.

In his welcome speech, Prof GOH Say Song, the Faculty’s Chair of the Teaching Excellence Committee, noted that it is increasingly imperative for graduates to be well-prepared in a complex and volatile world. He said, “Disruptive change has become the new normal. New technologies and developments are happening at a very rapid pace. Our graduates must be able to adapt to changes and continue learning.”

To enable workshop participants to further enrich their students’ learning experiences, the speakers shared the learning outcomes and pedagogies used to complement training in disciplinary knowledge with skills for lifelong learning.

In her lecture “Why Ask Questions?”, Prof CHNG Huang Hoon, Associate Provost (Undergraduate Education), observed how children ask more questions than adults, and shared how the General Education module would revive and nurture the spirit of curiosity through its focus on the art of questioning.

Prof YAP Von Bing, Department of Statistics and Applied Probability, then provided an update on the Quantitative Reasoning module, including lessons learnt and the challenges faced after two years of offering with a cumulative total enrolment of more than 11,200 students.

Dr Sirinut SAWATDEENARUNAT from the Centre for English Language Communication discussed how the module, Exploring Science Communication through Popular Science, equips students with the knowledge and skills to communicate complex scientific content in an accessible way to laymen audiences. Through an inquiry-based approach, students gain hands-on exposure in writing science articles and delivering public talks, which enables them to adapt to diverse communication needs.

The workshop concluded with a panel discussion, where the panellists shared their insights on the areas for development, the challenges faced and strategies to strengthen Science students’ lifelong learning skills. The panel members included Prof Chng, Prof Yap, Dr Sawatdeenarunat and Prof Lita CHEW, Department of Pharmacy and Chief Pharmacist, Ministry of Health.
NUS' Physics Department organised the fifth run of its annual Art of Science exhibition from 10 to 11 April. The exhibition drew close to 200 visitors.

The exhibition marks the conclusion of the Physics elective module GEK1547/GET1014: The Art of Science, The Science of Art.

The event challenges students to translate their learning experiences related to their course into visual art pieces. It is also an effort to promote interest in the visual arts in the NUS community.
Oppenheim Lecture 2017

The Oppenheim Lectures is a distinguished lecture series jointly organised by the Department of Mathematics and the Institute for Mathematical Sciences (IMS) at NUS. It was started in 2015, in honour of Sir Alexander OPPENHEIM, who held the position of Professor and first Head of the Department from 1931 until 1959, at the time of Raffles College. Prof Oppenheim was a well-known number theorist, notably for the Oppenheim Conjecture, which was settled by Gregori MARGULIS in the affirmative in 1986.

The speaker for the 3rd Oppenheim Lecture was Prof Elon LINDENSTRAUSS, Professor of Mathematics at the Hebrew University, who delivered a lecture “On an Effective Proof of the Oppenheim Conjecture (a joint work with G. A. Margulis)” on 15 February. Prof Lindenstrauss is well-known for his work in the area of ergodic theory and its applications to number theory. In recognition of his achievements, he was awarded the Fields Medal in Mathematics in 2010.

In conjunction with the Oppenheim Lecture, a Workshop on Ergodic Theory and Dynamical Systems was held from 14 to 16 February, with speakers from NUS and leading institutions in the Asia-Pacific region including the Tata Institute of Fundamental Research, Peking University and Seoul National University. Prof Lindenstrauss also shared his insights with students interested in mathematics and mathematical research at a special dialogue session on 16 February.

Through this distinguished lecture series, the Department of Mathematics and IMS hope to profile the Department’s research accomplishments and to cement its reputation as one of the leading mathematics departments in Asia.
NUSS Public Lecture by
Prof Stephen J HAWKINS

On 24 January, NUS Society (NUSS) Visiting Professor Prof Stephen J HAWKINS, hosted by the Department of Biological Sciences, delivered an NUSS Professorship lecture at Kent Ridge Guild House. Titled “The Impacts of Global Environmental Change on Marine Ecosystem”, he shared how human activities are adversely affecting the natural environment at an alarming rate, the potential impacts on marine life and the measures needed to conserve and protect our seas.

Prof Hawkins’ research takes an experimental approach using rocky shores as a convenient model system to understand interactions between species. He has also worked on shell fisheries, pollution, conservation and management of the coastal zone, including restoration of ecosystems in disused dock basins.

Close to 200 participants attended Prof Hawkins’ lecture.

Mr Glendon PHUA, a teacher at the Science Department (Biology), Temasek Junior College, said, “It was an interesting first step into the world of scientific academia, with each answer presented raising even more questions. The insightful and well-deliberated responses to questions from the floor really modelled how purposeful and meaningful scientific discourse should be carried out.”

Prof Hawkins was previously Director of the Marine Biological Association of the United Kingdom, England’s oldest marine laboratory founded in 1888, which has a world-leading reputation for marine biological research.

His research interests include experimental coastal ecology, long-term studies of climate change and other impacts on marine ecosystems, shell fisheries, as well as the management and restoration of degraded coastal ecosystems. He is particularly fond of limpets and barnacles.
BioBiz 2017

BioBiz 2017, the biggest annual conference focusing on the biomedical and pharmaceutical sectors which is organised by NUS, was held on 1 April at Suntec City Convention Centre. The event seeks to inform and engage stakeholders in the biomedical ecosystem in Singapore. The conference was open to industry professionals, students from polytechnics and the Institute of Technical Education (ITE), and the institutes of higher learning.

In support of Singapore’s Skills Future mission, the event provided an avenue for students and professionals to realise their aspirations through a wide range of career opportunities, informative panel discussions and professional career workshops which provided educational and career guidance. The event also brought together employers and a pipeline of skilled and qualified employees.

BioBiz 2017 was graced by the Chief Executive of Workforce Singapore (WSG) Mr TAN Choon Shian. In his speech, Mr Tan said, “As a sign of Singapore’s commitment towards the biomedical sciences industry, the Government has invested up to $4 billion under the Research, Innovation and Enterprise (RIE) 2020 plan. The opportunities in the biomedical industry in Singapore are many, and increasing, as more companies establish their base here.”

Mr Rajesh Kumar SHARMA, Chairperson of BioBiz 2017, said, “BioBiz 2017 attracted a record attendance of 741 students and professionals from the biomedical industry. This was an exceptional turnout.”

Panellists and alumni from multinational corporations (MNCs), Government agencies, research institutes and small and medium enterprises (SMEs) engaged in insightful discussions on their work experiences and addressed participant queries. The panel discussion topics were wide-ranging, and included current trends and developments in the healthcare sector, skills required to succeed in the biotechnology industry and the challenges and rewards of working in a medical technology start-up company.

Many of the attendees felt that the conference enhanced their understanding of the biomedical and pharmaceutical fields. It also provided them better understanding of the job opportunities available in these sectors through the host of panel discussions, networking sessions, company sharing sessions as well as booth presentations.
Inaugural National Pharmacy Residency Conference

On 23 February, the Office of Residency Training (ORT), NUS organised the inaugural National Pharmacy Residency Conference at the NUSS Kent Ridge Guild House for the pioneer cohort of seven Pharmacy Residents from the January 2016 intake who successfully completed their 12-month residency training under the Ministry of Health (MOH)-funded National Pharmacy Residency Programmes. Out of the seven graduands, five had completed the postgraduate Year 1 (PGY1) programme and two completed the Cardiology and Geriatrics postgraduate Year 2 (PGY2) residency programme, respectively.

In her welcome address, Prof Lita CHEW, MOH’s Chief Pharmacist, congratulated the residents and emphasised the important roles of advanced practice and specialist pharmacists in team-based patient and care integration, while serving as trusted medication experts, clinical educators and future leaders of the pharmacy workforce. She also urged pharmacy managers and leaders to support the commitment to reshape the pharmaceutical industry with a clear narrative of pharmacists’ roles and their potential contributions.
The Guest-of-Honour, Prof Benjamin ONG, MOH’s Director of Medical Services (DMS), noted the evolving healthcare landscape and the need to develop a future-ready healthcare system to address these challenges. This fast-evolving landscape requires pharmacists to continually acquire new competencies and enhance their professional and clinical skills through postgraduate education and clinical training programmes. Pharmacists with specialised expertise also play a role in ensuring safe and appropriate medication use in specific disciplines, such as cardiology and oncology, or patient populations such as geriatrics. Beyond involvement in research, Prof Ong urged the residents to also lead care transformation efforts, with a focus on reaching out to the community beyond acute care and promoting health and disease prevention, while balancing the quest for quality with value creation.

The conference’s invited speaker, Prof CHEN Fun Gee, Director of the Division of Graduate Medical Studies, NUS spoke about the importance and objectives of assessments in competency-based training. He shared examples of the different assessment methods that could be applied to evaluate clinical skills. He also provided the participants with an overview of the portfolio-based assessment framework which would be used for evaluating residents in the near future.

Prof ONG then presented the graduating residents their Certificate of Completion, at a certificate award ceremony.

In addition to receiving their Certificate of Completion, the residents were also given the opportunity to present their research projects which they had undertaken during the course of their residency programme.

In his closing address, Prof Alexandre CHAN, ORT’s Academic Advisor and Deputy Head, Department of Pharmacy, congratulated the residents on their achievements and expressed his hope that the residency programmes would be the spark to light their pathways as they continued to upgrade themselves and to improve healthcare services for hospitals and patients.

The seven residents who successfully completed the residency programmes are:

**NATIONAL PHARMACY RESIDENCY PROGRAMME (PGY1)**
- Ms CHEW Yue Xin Cindy
- Mr HO Choon Siang
- Mr LEE Chee Ping
- Ms TAN Weilin Rachel
- Ms YAO Yao

**NATIONAL PHARMACY RESIDENCY PROGRAMME IN CARDIOLOGY (PGY2)**
- Dr CHANG Shu-wen Grace

**NATIONAL PHARMACY RESIDENCY PROGRAMME IN GERIATRICS (PGY2)**
- Ms CHEONG Tingting, Selina
The annual Pharmacy Research Awareness Symposium is organised by the Department of Pharmacy, the Pharmacy Postgraduate Committee and the NUS Pharmaceutical Society. It serves as a platform for staff and students from the Department of Pharmacy to discuss research and scientific ideas, showcase research findings and foster collaborative ties with industry.

This year’s symposium was held on 5 April. The theme was “Healthcare from Bench to Bedside: Optimising Drug Development and Delivery”. The event drew over 300 attendees, including guests from hospitals, retail pharmacies and the pharmaceutical industry, faculty and students from Nanjing Tech University, students and staff.

The symposium comprised talks from six local and international speakers, including a lunchtime talk by Mr LIN Xiang Liang, Global President of Esco Healthcare, as well as six postgraduate and undergraduate student presentations. There were a total of 156 poster presentations and 16 prize awards.

The opening address was delivered by Prof Christina CHAI, Head, NUS Department of Pharmacy while the keynote address was given by Prof Gert STORM from the Department of Pharmaceutical Sciences, Utrecht University; MIRA Institute for Biomedical Technology & Technical Medicine, University of Twente; Centre for Image-Guided Oncological Interventions, University Medical Centre Utrecht; and Royal School of Pharmacy, Copenhagen.

Other invited speakers included Prof Thomas Hugo KELLER, Deputy Director, Medicinal Chemistry, Experimental Therapeutics Centre, A*STAR and College of Science, Nanyang Technological University; Prof Josip CAR from the Lee Kong Chian School of Medicine, Nanyang Technological University and School of
In line with the theme, the speakers and student presenters shared on how their research in drug development and delivery plays a role in bringing healthcare from bench to bedside. Topics ranged from laboratory-based research to clinical research in patient populations, as well as merging informatics solutions such as mobile apps and automated compounding to enhance patient care.

Participant Shawn Ignatius TAN said, “We learnt more about our peers’ projects. The talks by the guest speakers also broadened my understanding of the various types of research done in the pharmaceutical field.”
The Chemistry Laboratory at the Tahir Foundation Building is one of the inaugural winners of the platinum awards under the new Green Mark for Laboratories scheme launched by the Building and Construction Authority (BCA) in May 2017.

The new scheme is the world’s first green certification scheme for laboratory design and operation in Singapore. It recognises efforts and commitments by laboratory owners and operators to reduce the environmental impact of laboratory operations. It also complements the BCA Green Mark for Buildings scheme by encouraging laboratory operators to adopt best practices, optimise operations of laboratory equipment and systems, while addressing safety requirements.

Laboratories have high receptacle load due to specialised needs, the need for fresh air dilution to meet safety requirements and long operating hours. These result in laboratories being highly energy-intensive, typically consuming about 3 to 5 times more energy than an office space.

The Chemistry Laboratory at the Tahir Foundation Building incorporates green designs, features and practices that make them environmentally sustainable. For example, localised exhaust was installed for critical heat sources to reduce ventilation energy. On-site energy recovery was also implemented to reduce the energy required for specific humidity control.
How does Grab assign a driver in the shortest possible time? Are driverless cars safe?

To address these questions and how mathematics and statistics come into play in the realm of data science, the Department of Mathematics held its inaugural Data Science and Analytics themed event on 15 March.

Head of Department Prof ZHU Chengbo welcomed participants and shared on the new Data Science and Analytics programme. The four-year direct Honours programme is designed with sufficient technical depth to equip graduates with the ability to develop novel analytical tools for new scientific applications and industry problems that will emerge in future. The programme is offered by the Departments of Mathematics and Statistics and Applied Probability in the Faculty, in conjunction with the School of Computing.

Sharing their expertise at this event were Mr TAY Yu Xuan, Data Scientist, GovTech and a Statistics alumnus; Dr YANG Liuqin, Data Scientist, Grab and a Mathematics alumnus; and Prof JI Hui from the Department of Mathematics.

Mr Tay provided a peek into his work in the data science field, how it contributes to GovTech’s roles in transforming the delivery of Government digital services and developing Smart Nation capabilities, as well as career prospects in the data science industry. Dr Yang
Prof Ji Hui offered participants a glimpse into the technology behind driverless cars.

Dr Yang Liuqin brought participants through what goes on “behind the scenes” at Grab.

delved into mathematical problems faced by Grab, such as how to balance match quality and match rate, and how their data science team solves them, using two main mathematical models – the optimisation model and the prediction model.

Prof Ji ended the event with his intriguing presentation on driverless cars, and how mathematics is a driving force behind advances in visual navigation technologies which are critical for safe driving. He also shared several mathematical concepts and computational algorithms that contribute to building state-of-the-art visual navigation systems.

Through this event, the Department of Mathematics seeks to reach out to the general public and pre-university students, to share on the fast-growing field of data science and its applications in daily living.

Stephanie SEOW Xi Hui, a Meridian Junior College (MJC) student, said, “I learnt what data science was about and how relevant it is, making it a very promising career choice. It is also a mix of subjects I am interested in – programming, business and statistics. The event piqued my interest in the data science programme.”

Serene LEE Si Ni, MJC student, said, “I learnt how data science is a key factor behind GrabTaxi’s operations – for instance, how it is used to navigate drivers to the best suited passengers according to distance. With this programme, I truly understand the system of driverless cars, such as the sensors and how data science plays such a significant role. The programme was really insightful as we discovered how mathematics is applicable in our daily lives, like how the matrix is being used in driverless cars. Mathematics plays a huge role in making GrabTaxi and driverless cars possible.”

Teachers from MJC also provided positive feedback.

“It is an enriching experience as the programme provided insights into the exciting field of data science and analytics and demonstrated the real-life applications of mathematics. In particular, it was fascinating to learn about the applications of mathematics in optimising GrabShare matches and how operations in matrices were used in data processing for driverless cars. This enabled us to appreciate how data science analytics is relevant even as technologies continue to evolve rapidly.”

Another teacher from MJC said, “Mr Tay shared useful information, such as some of the skills required to be a data scientist and the computer language predominantly used. This will inspire those with knowledge in computer languages. Also, we got to learn something new, such as machine learning.”

The inaugural event was attended by more than 150 participants. The Department plans to organise such events on a regular basis in the future.
Inaugural Teachers Workshop
Ms Suiniaty Basirun, Country Manager of Dow Singapore, delivered the opening remarks.

Head of Chemistry Prof Richard Wong welcomed the teachers and gave a brief overview of the Chemistry department.

Mr Lim Kim Yong, Scientific Manager, Science Demonstration Laboratory, running through the day’s programme.

The Science Demonstration Laboratory, Department of Chemistry and Dow Chemical Pacific (Singapore) Pte Ltd collaborated to launch the inaugural NUS-Dow Surprising Science Teachers’ Workshop on 1 June.

The workshop was intended to provide teachers with a perspective of how science in industry has made a positive impact on society. A total of 30 teachers from 19 schools and junior colleges attended the one-day workshop which was held in the morning at NUS’ Department of Chemistry and in the afternoon at Dow Consumer Solutions’ Laboratory at Fusionopolis.

The morning saw the teachers performing a series of experiments involving soap bubbles, diaper chemistry and hydrophobic coatings. Undergraduates from the Young Educators in Science programme provided pointers and discussed with teachers ideas and materials for use in classroom teaching.

The industrial visit in the afternoon started with a presentation by Dow scientists on the various applications of silicone products. This was followed by a laboratory tour where participants went through demonstrations of industrial products such as in coatings, cosmetics, sealants, food packaging etc.

Ms LI Xuanjun from Temasek Junior College said, “It is a good workshop as it allows teachers to get an exposure to what Dow Chemical and the industry are doing. The effort by NUS to promote Science and Mathematics to the public is commendable.”
Captivating public interest in scientific concepts

M.Sc. in Science Communication students staged two initiatives which enthralled the public in science. At NUS Open Day 2017, a team of students put up a busking performance, a series of “show and tell” sessions to illustrate science concepts. On 22 April, another team presented “A Day in Diagon Alley” at the Science Centre Singapore, comprising demonstrations to explain diverse scientific topics ranging from properties of light to brain anatomy.
Illustrating science through busking

Participants were challenged to eject marshmallows through a hollow tube, as far as possible. The physics of the moving marshmallow inside and outside the tube were explained, including the parameters affecting the distance travelled by the marshmallow.

The team also demonstrated the science behind a good cup of coffee by live brewing and coffee tasting to show different flavours and chemical compounds in coffee. Visitors were invited to taste different coffee samples made with different brewing parameters such as grind size and temperature.

Another performance dramatically showed the catalytic decomposition of hydrogen peroxide into water and oxygen. Detergent was combined with household products that generated large amounts of foam resembling a large column of toothpaste (“Elephant Toothpaste”).

The buskers also performed the Oobleck, a fascinating science experiment to illustrate the Oobleck non-Newtonian fluid which acts like a liquid when poured, but like a solid when a force is applied. After the hard work of mixing 25 kg of corn starch with litres of water, visitors had great fun stepping and dancing on a big tub of Oobleck!
Bucket Science Symposium 2017

The symposium on 22 April brought to life diverse scientific topics ranging from properties of light, density of solutions and brain anatomy. Held annually, the event aims to engage the public by making science accessible through eye-catching explanations and demonstrations of science concepts.

The demonstrations were grouped according to subjects offered by Hogwarts, the School of Witchcraft and Wizardry attended by Harry POTTER and his friends. “Lessons” were offered under the enticing titles of Potions, Charms, Muggle Studies and Defence Against the Dark Arts. The result was a heady concoction of science and magic. For instance, one lesson explored the science behind the invisible ink in Tom RIDDLE’s diary. Another offered a simple, non-magical alternative to Harry’s favourite Expelliarmus charm.

The symposium was attended by around 150 participants. A group of inquisitive children also stayed throughout the event and enthusiastically volunteered answers and their own participation for every demonstration.

SIEW Chin Hoong, an M.Sc. in Science Communication student, said, “Team members came together to brainstorm and coordinate the variety of science demonstrations. It was very fulfilling to watch our ideas turn into reality.”

Defending oneself against the “Dark Arts”, Fadil Bin Abdul Rahman demonstrated the construction of an air cannon.
Another student WU Manchao said, “It was heartening to see many young children among the audience eager to participate in our performance. We achieved our objective of creating interest in science.”

Yasmynn DINOALFIAN, a student from Marymount Convent School said, “The Harry Potter applications made science come alive. The lessons were engaging and easy to understand.” Yasmyn’s parents said, “The experiments and lessons were very interesting and tied in well with the Harry Potter theme. We had a fun time as a family and learnt a lot from the knowledgeable presenters.”
The Departments of Biological Sciences, Chemistry, Mathematics, Physics and Statistics and Applied Probability each hosted a half-day visit to encourage prospective students who received admission offers to study Science at NUS. The departments customised their programmes to provide information on our Science courses, other learning opportunities and the career prospects of Science graduates.

The activities, held from 10 to 22 April, included talks, laboratory visits, hands-on activities and meetings with Faculty members and students. These visits complemented the Faculty’s key pre-admission events, namely, NUS Open Day and the Faculty Open House.
The Department of Biological Sciences organised talks by Prof Henry MOK on an overview of NUS Life Sciences, Prof Antonia MONTEIRO on Environmental Biology, Prof Cynthia HE on Molecular and Cell Biology and Prof Timothy SAUNDERS on Biophysics. Following a tea session, visitors were given guided laboratory tours of the Protein and Proteomics Centre, a facility housing state-of-the-art mass spectrometers for advanced research in proteins and oncology biomarker research for rapid cancer detection and screening applications; a new insectary for exotic insects and spider species from all over the world; and the Centre for BioImaging Sciences, which focuses on the science and application of biological imaging by light and electron microscopy.
The Department of Chemistry arranged a half-day programme for visiting students and their parents, commencing with a talk on the Chemistry undergraduate curriculum by Prof Richard WONG and Prof ANG Wee Han. The talks focused on the syllabus, its relevance to industry and future career prospects. The students were also given the opportunity to conduct hands-on practicals in preparing metal-organic frameworks with luminescent properties, at the new General Chemistry Teaching Laboratory, to pique their interest in inquiry-based experiments. The visitors were also brought around campus on a bus tour. The session ended with a tea session hosted by Prof Wong during which the participants interacted with faculty members over light refreshments.

The Food Science and Technology Programme, which is admitting students through Direct Admissions for the first time in 2017, organised a programme introduction on the course curriculum and career prospects. This was followed by a forum session where students and parents had their queries addressed by undergraduates, alumni and faculty staff.
The Department of Mathematics organised talks by Prof Victor Tan on the Mathematics curriculum and career prospects for graduates, Prof Tan Hwee Huat on the Quantitative Finance programme and a sharing session by alumnus Mr Khor Shi-Jie who spoke about how studying mathematics helped him in his job with Google. Visitors were also given the option to have a department tour and to participate in a Maple Software laboratory session.
The Physics Department organised a student sharing session and a curriculum talk. It also hosted tours to its laboratories and facilities. These included the Roll-off-Roof Observatory (2011): 17” Plain-Wave CDK (F6.8 Corrected Dall-Kirkham) Astrograph Telescope (Dual carbon-fiber truss design) equipped with a 4” Takahashi (Hydrogen Alpha SolarScope) on the latest computerised Showa 25E German Equatorial Mount; the Centre for Ion Beam Applications, which develops new technologies based on fast protons and ions; as well as the Science Demonstration Laboratory which encourages science discovery through hands-on demonstrations.

For the first time, visitors were introduced to the new Data Science and Analytics programme through an academic talk and a lunch reception-cum sharing session by Statistics alumnus Dr Murphy CHOY, Director of Analytics, Operations and Technology, DART Institute. Dr Choy discussed a practitioner’s perspective of data analytics and how his passion for statistics kindled his ability to perceive problems in many dimensions and to implement complex solutions.
The Department of Mathematics regularly organises learning journeys for junior college (JC) students with interest and aptitude in mathematics and/or who plan to study mathematics in university.

This outreach programme introduces prospective students to NUS’ Mathematics course and creates awareness on the relevance and applications of mathematics.

The first session in 2017, organised on 20 January, was attended by 38 students from Anderson JC, Catholic JC and Temasek JC. Subsequent sessions were held on 17 February, 10 March and 7 April.

Each session spans about three to four hours and comprises enrichment talks related to topics in A-Level H2 mathematics, such as calculus, sequences and series, and probability, as well as a hands-on computer laboratory session where students learn how to use Maple software for graph plotting. Participants also meet current undergraduate students to find out more about university life and studying Mathematics in NUS.

Anderson Junior College (AJC) student CHUA Xin Yi said, “I learnt a lot about how mathematics can be used in our daily lives and in various industries. The experience was meaningful and enriching and provided me insights to make a more informed choice on my course of study in university.”

Another AJC student Jasmine SEAH said, “Through the learning journey, I realised that there are many areas to delve into when pursuing a degree in Mathematics, be it finance or computational mathematics. The experience truly opened my eyes to the unlimited possibilities of mathematics.”
## What’s Up?

**Check out the events from June to November 2017!**

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<td>1 - 9 Jun</td>
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<td>Statistics Enrichment Camp</td>
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<td>6 - 9 Jun</td>
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<td>16 Jun</td>
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<td>5, 12, 26 Jul</td>
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