

NUS IN 2019

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2019 in Review

2019 marks the first full year of the new leadership team taking the helm, steering NUS on our journey forward to become a *leading global university, shaping the future*.

It has been a busy and fulfilling year for NUS. In 2019, we strengthened our ability and capacity for innovation in education, research, enterprise and administration. The culture of excellence and continuous improvement is evident: lifelong learning is being integrated into our university education model, while the curriculum continues to be enhanced to develop future-ready graduates. In research, NUS has strengthened our research leadership and impact by engaging in research translation, deepening significant partnerships and collaborations that bring about positive impact to society. NUS is also building a thriving Innovation and Enterprise ecosystem with a focus on deep technology in Southeast Asia, with Singapore as a key node. NUS has also made good progress in our quest for organisational excellence, with improved internal governance, policies and processes; we have achieved greater internal efficiencies and raised the bar for quality administration.

Let me share some key highlights and achievements.

The NUS Students' Union (NUSSU) celebrated its 70th anniversary milestone this year. Themed '*Reach Out*', [Rag 2019](#) was a particularly purposeful celebration, as it was brought into the heartlands for the first time – Ficus Green at Bishan-Ang Mo Kio Park turned into a sea of colour and vibrance on 10 August 2019. On this

occasion, NUS was delighted to welcome over 8,000 incoming freshmen. This event was a culmination of NUSSU Rag & Flag, a tradition unique to the University since the 1950s that encourages the NUS community to contribute towards improving the welfare of the less privileged. About 7,800 NUS students visited various parts of Singapore on [Flag Day](#) (28 July and 5 August 2019) to seek donations from members of the public. Our students raised \$366,927 through NUSSU Rag and Flag 2019 for 22 charity programmes supported by Community Chest.



NUSSU Rag & Flag 2019

[Commencement 2019](#) was another memorable event. We celebrated with 11,127 graduates who were presented with their degrees from 11 to 18 July. A total of 6,663 Bachelor's degrees and 4,464 graduate degrees was awarded over 24 ceremonies. NUS Chancellor and Singapore President Madam Halimah Yacob conferred an Honorary Doctor of Letters on philanthropist, prominent businessman and active community leader Mr Chua Thian Poh, Founder of Ho Bee Group.



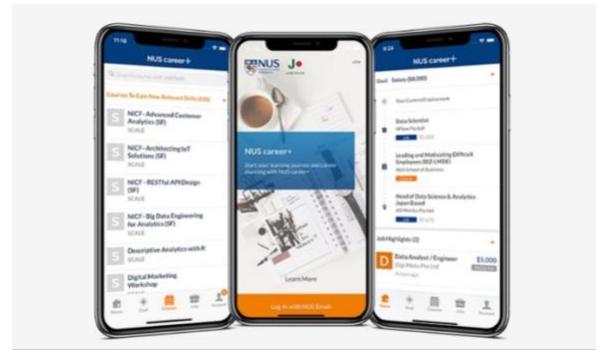
Commencement 2019 - Honorary Graduate Dr Chua Thian Poh

Innovating new pathways in education

NUS has moved swiftly to integrate continuing education into our educational model, and to establish ourselves as a preferred partner for high quality continuing education programmes. In 2019, we put in place a more flexible and responsive framework for delivering graduate-level coursework programmes and modules by offering **graduate diploma and graduate certificate programmes, individual graduate modules** and where relevant, **sequential credentialing**. This framework allows learners access to NUS' portfolio of coursework Masters programmes without having to matriculate into the degree programme.

The [NUS CET500 course catalogue](#), comprising cutting-edge courses to help learners stay competitive in this digital age, was launched in 2018. In 2019, the catalogue has grown to offer 650 courses. Corporate organisations can tap NUS' extensive range of academic and executive programmes to upskill and reskill their workforce through the All-You-Can-Learn scheme, which has been well received. In 2019, seven organisations, with a projected demand of 18,000 training days, have signed MOUs to come onboard the programme.

To help our students and alumni stay competitive and advance in their careers, NUS rolled out a [career+ mobile application](#), jointly developed by NUS and JobTech Pte Ltd. The app utilises big data and artificial intelligence to help users set career goals, provide recommendations on jobs as well as the relevant courses to close skill gaps. In May, the career+ app became the #1 Trending App on the Google Play Store and #10 in the Education category on the Apple App Store.



NUS career+ mobile app

The School of Continuing and Lifelong Education launched **two new MSc by coursework programmes, in Industry 4.0 and Venture Creation**. The [MSc in Industry 4.0](#) is a multidisciplinary graduate degree programme developed to support Singapore's drive to become a Smart Nation, and the needs of organisational digital transformation. The [MSc in Venture Creation](#) is an immersive graduate degree programme that is designed to transform mindsets and accelerate the translation of ideas into solutions. The programme taps the expertise of NUS Enterprise to support aspiring entrepreneurs by providing mentorship in business development and opportunities to network for market access.

In January 2019, NUS joined [edX](#), a not-for-profit massive open online course (MOOC) provider. This is in addition to [Coursera](#), another MOOC provider, whom we have partnered since 2013. Joining edX allows NUS students to use MOOCs to augment courses on campus; NUS can also launch MOOCs for a global audience.

This academic year, the University launched [Design-Your-Own Module \(DYOM\)](#) to encourage our students to explore learning beyond their own disciplines, via edX MOOCs, or by engaging with NUS lecturers, administrative staff or industry leaders to do group work. DYOM encourages students to embrace self-directed education within four modular credits' worth of Unrestricted Elective space.

To facilitate access to an NUS education, we have been awarding bonus admission points to an undergraduate applicant's first choice course. And in recognition of diverse talents, we are collaborating with polytechnics to admit graduating students with a strong entrepreneurial inclination.

Scaling new heights in research and translation

Our research achievements have been recognised by the international academic community. NUS continues to feature among the top Asian universities in the rankings by Times Higher Education and Quacquarelli Symonds (QS). Nine subjects attained a top-10 ranking in the QS World University Rankings by Subject 2019. In

November 2019, Clarivate Analytics listed 27 NUS researchers as among the highly cited academics globally in their respective fields. The annual Highly Cited Researchers list from the Web of Science Group identifies scientists and social scientists who have demonstrated significant influence through publication of multiple papers that are ranked in the top one per cent by citations for their field and year of publication.

Our research outcome is impressive. In 2018, NUS researchers recorded over **10,300 publications** across leading academic journals, conference proceedings and books; 773 articles were published in journals with a high impact factor. As a measure of the academic significance of NUS research, **the number of homeruns¹ at NUS has increased nearly six-fold over the last decade**, from 41 homeruns from 1999 to 2008, to 242 from 2009 to 2018. FY2018 also saw NUS achieving its **highest ever annual research grant income, at \$781 million.**

NUS endeavours to develop research strengths in the traditional basic sciences, theoretical fields, as well as in translational research. We are also venturing into evolving multidisciplinary research areas. In 2019, the [Department of Food Science and Technology \(FST\)](#) at the Faculty of Science was established – the first-of-its-kind within Singapore's university sector. FST will nurture graduates for Singapore's vibrant food manufacturing industry, and will conduct research that will advance Singapore's food industry, and help Singapore achieve food resilience and security.

¹ Homeruns refer to publications with 20 times more citations than the average in a particular discipline.

FST's faculty have been forging ahead with interesting discoveries and products, for example [Soynergy](#) drink, which is a probiotic beverage rich in gut-friendly nutrients, made from okara using a patented zero waste process. Another FST research team, led by Associate Professor Huang Dejian has developed plant protein-based bioink which is used for the 3D printing of scaffolds for cell and meat culture applications. Their research discoveries are patented, and both have been commercialised through spin-off companies under Soynergy Pte Ptd and [Kosmode Health Singapore](#) respectively.



FST collaborates with many industry partners in the food industry, including Kikkoman, Nestle and COFCO Beijing

Industry collaboration is vital as we seek to bring about positive impact and contribute directly to the wellbeing of society. NUS is home to five corporate laboratories which seek to engage in research that develops cutting-edge solutions to problems faced by industry. In 2019, NUS entered into a partnership with Agilent Technologies, a leading industry player in the life sciences, diagnostics and applied markets, to set up the [NUS-Agilent Hub for Translation and Capture](#). The NUS-Agilent Hub is a unique model of tightly integrated academic-clinical-industry collaboration that taps the biomedical R&D at NUS, clinical expertise at the National University Hospital (NUH)

and advanced mass spectrometry technology at Agilent, to carry out collaborative research that will lead to the development of innovative mass spectrometry-based clinical assays that can help to improve the speed and accuracy of diagnosis for prevalent diseases.

NUS is also extending our research network overseas, through significant collaborations with international partners. In December 2018, the **Tianjin University-NUS Joint Institute** was set up to pioneer novel and transformative technologies in emerging optoelectronics and flexible electronics, advanced manufacturing and energy materials and catalysis. The Institute will host up to 60 NUS PhD students participating in research projects and exchanges each year.

In June 2019, NUS' **Lloyd's Register Foundation Institute for Public Understanding of Risk** partnered with global analytics and advisory company Gallup and Understanding Risk, an initiative of the Global Facility for Disaster Reduction and Recovery supported by the World Bank Group, to research the global perception, measurement and communication of risk. NUS is the first university in Southeast Asia to partner Gallup on the Lloyd's Register Foundation World Risk Poll, a first-of-its-kind endeavour which would allow NUS researchers access to new emerging data in order to shape international policy and implement relevant interventions.

And in November 2019, NUS signed an agreement with Chinese partners to set up the **NUS Guangzhou Research Translation and Innovation Institute** in Guangzhou that aims to address

Guangzhou's industrial and market needs via technological innovations. Specifically, the new Institute will focus on research translation and the training of Chinese talent over the next 10 years.

The entities in *innovation4.0*, which houses the NUS Smart Nation research cluster, are powering ahead with their missions, and doing well. AI Singapore, for example, has supported over 40 companies in their AI adoption through the 100Experiment programme; an AI makerspace has been launched as the go-to place for SMEs and start-ups to begin their AI journey. The Singapore Data Science Consortium (SDSC) is the key platform in Singapore for industry to access the latest data science technologies, applications, and expertise from academia to create innovative solutions that solve real-world challenges. The SDSC has supported 10 industry projects with local companies.

Similarly, our new SDE4 will be a focal point for Urban Sustainability Solutions while COM3 @ Imagination Ridge, due for completion in 2020, will serve as a key node to foster collaborative and innovative research in data sciences, artificial intelligence, cybersecurity, optimisation research and analytics.

Advancing innovation and enterprise

NUS is growing our entrepreneurial and innovation network, with a particular focus on Southeast Asia. The [NUS Overseas Colleges \(NOC\) programme](#), which began in Silicon Valley in 2001, has since expanded to 12 locations across the world, including Southeast Asia. The [NOC Southeast Asia programme](#) now includes

Bandung and Ho Chi Minh City, in addition to Jakarta and Yogyakarta.

The NOC programme has been successful in developing a pipeline of talent possessing entrepreneurial and intrapreneurship mindsets and traits, as well as in creating founders, tech start-ups and scale-ups, all of which are critical for the innovation-led economy that Singapore is aspiring towards. A survey of NOC alumni was conducted in 2018 to understand the impact of the programme and the full report is available [here](#).



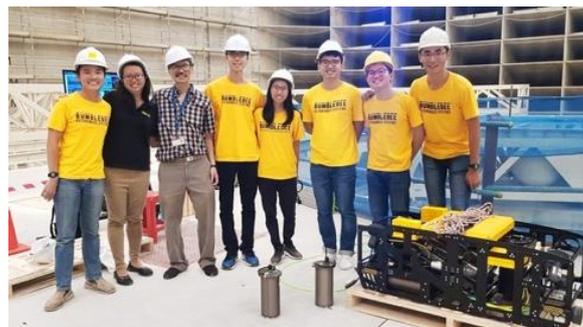
BLOCK71, NUS' distinctive incubator concept, launchpad and network, has added a second location in Suzhou; BLOCK71 Suzhou 2 was launched in January 2019 in partnership with NUSRI and Ascendas Singbridge China. In November 2019, NUS partnered with Vietnamese state-owned property developer Becamex IDC Corporation to establish a [BLOCK71 Vietnam](#). The eight BLOCK71 locations, together with the Hangar at our Kent Ridge Campus and NUS Enterprise@Singapore Science Park, house more than 300 start-ups and projects each year. Several NUS start-ups raised significant funding in 2019, such as [Carousell](#), [Biofourmis](#), [Shopback](#) and

[Visenze](#). To accelerate access to NUS' reservoir of research and technologies, TAP NUS, an intensive, cohort-based Technology Access Programme will soon be launched, providing reach to our technologies, know-how and insights for the applications of these technologies for new products or businesses, including creation of deep-tech ventures.

Last year, NUS launched a flagship programme, the [Graduate Research Innovation Programme \(GRIP\)](#) to support, encourage and enable NUS PhD students, researchers and faculty to move their research outcomes from the lab to the market by forming start-ups based on research and deep technology. Under this programme, NUS has committed \$25 million to co-create up to 250 companies over five years. The results have been encouraging: to date, three runs of the GRIP programme venture hothouse have been completed. Close to 60 teams have undergone the programme with about 41 teams selected to receive \$4.1million from NUS; of these, several GRIP companies have secured significant venture financing, purchase orders and/or have signed term sheets with venture and angel investors from the region. The full list of GRIP project descriptions is available [here](#).

Let me highlight two examples:

- [BeeX](#), which is a Deep Technology Engineering spin-off from NUS, built an autonomous high mobile underwater vehicle for the maritime industry that can operate wirelessly and can be programmed with specific mission routes using artificial intelligence. BeeX founders Grace Chia and Goh Eng Wei, who were part of the original founding team of Faculty of Engineering's Bumblebee



BeeX

Autonomous Systems robotics team, recently secured a multiyear multi-million dollar project with an oil and gas company.

- NuSpace is a nano-satellite company providing Internet of Things (IoT) connectivity and data platform services from space using a constellation of nano-satellites. It aims to build a constellation of nano-satellites to bring IoT connectivity to places previously not economically feasible and to provide wide coverage IoT connectivity to things like tracking of livestock, maritime shipment and management of agriculture-tech devices, especially in the equatorial belt regions with fast-growing emerging economies. NuSpace is an NUS spin-off, founded by Ng Zhen Ning and Dr Luo Sha, researchers at NUS Engineering. It is the first space-tech spin-off from NUS' space technologies research under NUS GRIP and they have raised an undisclosed amount from a Japanese investment firm.



NuSpace

We are hopeful that in the years to come, GRIP will continue to produce a strong pipeline of innovative technology start-ups and spin-offs from NUS.

Nurturing talent and the next generation of Singaporean academics

As a leading global university, NUS recruits top academic talent from Singapore and the world. We are pleased that outstanding academics such as Nobel Laureate Professor Sir Konstantin Novoselov, Professor Andrew K Rose and Professor Rong Li, among others, have joined NUS recently. Besides research-intensive faculty, NUS has also brought in leading industry practitioners like Professor Robert Morris, Professor Michael Si and Mr Bert Hofman, who are able to bridge and deepen the education-industry-academic nexus.



Prof Sir Konstantin Novoselov
Tan Chin Tuan Centennial Professor
Materials Science & Engineering

Prof Andrew K Rose
Distinguished Professor
Dean, NUS Business School

Prof Rong Li
Distinguished Professor
Director, Mechanobiology Institute



Prof Robert Morris
Medicine

Prof Michael Si
Civil & Environmental Engineering

Mr Bert Hofman
Director, East Asian Institute

Young Promising NUS Researchers



Asst Prof Shao Huilin
Biomedical Engineering

Asst Prof Benjamin Tee
Materials Sci & Engineering

Asst Prof Loh Huanqian
Physics



Asst Prof Michael Erlewine
English Language & Literature

Asst Prof Patricia Chen
Psychology

I am pleased that NUS is home to many young promising researchers, some of whom are Presidential Young Professors. We also congratulate our senior researchers for their accomplishments. Professor Artur Ekert, Director of the [Centre for Quantum Technologies \(CQT\)](#), was one of only 19 scientists this year who were recognised by the Web of Science Group as having publications cited with a frequency ranking in the top 0.1 per cent of scientists. Professor John Eu-Li Wong, NUS Senior Vice President (Health Affairs) and National University Health System Chief Executive, was elected as an international member of the US National Academy of Medicine, a globally influential organisation on health and science. Professor Dario Campana was awarded the prestigious Jacob and Louise Gabbay Award for his breakthrough work in CAR-T cell therapy, an immunotherapy regimen that has dramatically improved outcomes for certain leukaemias and lymphomas.

This year, our clinician scientists garnered several National Medical Excellence and National Medical Research Council awards. They include Adjunct Professor Goh Boon Cher and Professor Toshio Suda from Yong Loo Lin School of Medicine and Cancer Science Institute of Singapore, who received the National Outstanding Clinician Scientist Award and the STaR Investigator Award respectively.

Our researchers were also accorded Singapore's highest research and innovation accolades at the President's Science and Technology Awards 2019. The prestigious President's Science Award was presented to Professor Toh Kim Chuan from the Department of Mathematics and Institute of Operations Research and Analytics; and a team from the Singapore Eye Research Institute comprising Associate Professor Audrey Chia, Professor Saw Seang Mei, Professor Roger Beuerman and Adjunct Professor Donald Tan from Duke-NUS Medical School. Additionally, Assistant Professor Charles Lim from NUS Electrical and Computer Engineering and CQT, and Assistant Professor Shao Huilin from NUS Biomedical Engineering and Institute for Health Innovation & Technology were also honoured with the Young Scientist Award at the same event.

NUS takes a strong interest in grooming and nurturing the next generation of Singaporean academic talent. A suite of scholarship, recruitment and career development pathways has been put in place to help aspiring Singaporean academics to succeed in their careers. In 2019, two new schemes were introduced: the **Inauguration Grant**, a scheme co-funded by the Ministry of Education to

attract Singaporean academics to join NUS as tenure-track assistant professors; and the **Development Grant** which Singaporean PhD students or postdoctoral fellows can leverage to advance their research work and to help them gain a head start in establishing themselves in academia.

NUS successfully convened the inaugural [Singaporean Researchers Global Summit](#), held on 6 and 7 August 2019. The event brought together 120 Singaporean researchers, postdoctoral fellows and PhD students who were based overseas, and gave them the opportunity to be acquainted with key research developments in Singapore, and to connect with academic and industry leaders.



Singaporean Researchers Global Summit

A safe, smart and sustainable campus

Under Phase 1 of the 'Planting 10,000 Trees' initiative which was launched in 2018, some 4,000 trees have been planted at hot spots, main roads, carparks and along building facades and infrastructure. The tree planting is progressing well, and we can look forward to a lush, greener and cooler campus.

Locations of 4,000 New Trees for Phase 1



The "Planting 10,000 Trees" initiative began in 2018

Singapore's [first new-build net-zero energy building SDE4](#) was launched in January 2019. SDE4 is designed to be climate responsive, energy efficient and environmentally friendly; it is a dynamic living laboratory which showcases the latest ideas and solutions in sustainable development using green technologies. SDE4 has won many awards for its state-of-the-art features in sustainability such as the 2018 Building and Construction Authority Green Mark Platinum and the Global Human Settlements - Model of Building Award in November 2018. SDE4 is also the first university building in the world to achieve WELL Certified™ Gold, and the first building in Singapore to be conferred this prestigious WELL Certification.



SDE 4

The [National University Centre for Oral Health, Singapore](#), which was officially opened in July 2019, consolidates NUH's University Dental Cluster, NUS Faculty of Dentistry and research facilities in a single location, allowing dental specialists, professionals, students, faculty and researchers to draw on each other's strengths to bring about better clinical care, high impact research and education. With the integrated facilities, NUS Dentistry undergraduates can look forward to more personalised learning through the innovative use of educational technology that complement conventional methods of training and education.



The National University Centre for Oral Health, Singapore was officially opened in July 2019

Beyond new buildings, the NUS campus is also a living laboratory for transport innovations. In July 2019, the [NUSmart Shuttle](#) began operating on campus on a

route between Heng Mui Keng Terrace and Business Link. It is the first autonomous shuttle bus to operate in real mixed traffic conditions alongside regular buses, cars and motorcycles.

A parallel effort is our own **NUS-developed Autonomous Bus**, with a bigger form factor. This effort builds on what has been achieved in the research work of NUS' Advanced Robotics Centre (ARC) at NUS Engineering and Singapore-MIT Alliance for Research and Technology towards mobility on-demand using Autonomous Technologies. Starting January 2020, NUS ARC will gather a team of NUS students to make an Electric Bus Autonomous by applying the algorithms that it has developed. This is a fine example of how the NUS campus is a living laboratory where our students can engage in enriching experiential learning through campus development projects as well as serve the needs of the NUS community.

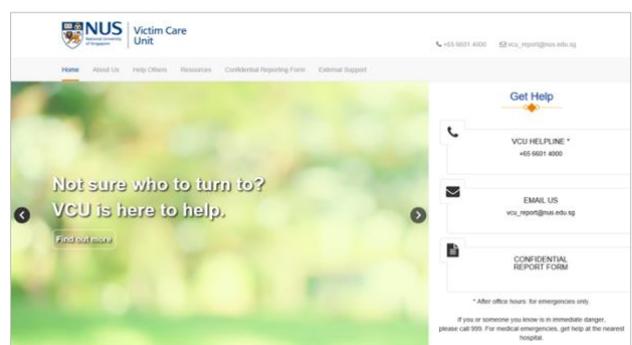


Opening of Micron's Expanded Fabrication Facility in collaboration with the NUS Advanced Robotics Centre on 14 August 2019

NUS has also taken significant steps to improve the safety and security of our campuses. The University takes a strong stand against any form of sexual misconduct on our campuses. The incidents that surfaced earlier this year, together with inputs from our stakeholders and the public, have informed our efforts to strengthen our

internal policies and procedures. In addition to infrastructure security enhancements, training, and increased deployment of security personnel, **a tougher sanctions framework and enhanced disciplinary process** have been put in place to address sexual misconduct on our campuses.

The University's tougher stance on sexual misconduct is complemented with our commitment to provide greater support for victims. The [NUS Victim Care Unit](#) headed by Associate Professor Sandy Lim, the first-of-its-kind in Singapore universities, was set up in August 2019 to provide a central point of contact, as well as confidential and professional care to victims of sexual misconduct in NUS.



victimcare.nus.edu.sg

To raise greater awareness of issues relating to respect and consent and the resources NUS has in place to address sexual misconduct, all staff and students are required to complete a module on "A Culture of Respect and Consent".

Giving back to the community



NUS Day of Service 2019

The NUS Day of Service (DOS) is a testament to NUS' strong tradition of serving and contributing to Singapore and to society. In its fourth year, DOS 2019 saw more than 2,000 NUS staff, students and alumni organising and participating in 53 community-initiated projects ranging from animal welfare and the environment, to children and the elderly. NUS alumni chapters in nine cities across the world also played their part on DOS 2019.

NUS Alumni Awards 2019

We are deeply proud of our [2019 NUS Alumni Awards](#) recipients, who have contributed with distinction in their respective chosen fields and have made a difference to society and humanity. NUS conferred two Eminent Alumni Awards to former Chief Justice and NUS Pro-Chancellor Dr Chan Sek Keong and former top civil servant and former NUS Pro-Chancellor Mr Ngiam Tong Dow. There were also six Distinguished Service Alumni Awards and 11 Outstanding Young Alumni Awards recipients. I am especially encouraged to see a record number of young entrepreneurs receiving the Outstanding Young Alumni Award this year.



NUS Alumni Awards 2019

Embracing change and continual improvement

In the spirit of continual improvement, we have embarked on an [Organisational Excellence \(OE\)](#) journey to improve and professionalise the operational efficiency of our administration.



OETU sharing at the L.E.A.P (LEadership Accelerator Programme) training in September 2019

An OE Transformation Unit (OETU), headed by Dr Shaun Ho, was set up under the Office of the President. The OETU has been working with stakeholders across the University to review, reengineer and improve key corporate processes in Human Resources, Finance, IT and Procurement. To raise professionalism and improve accountability, administrative staff performing the four core functions were moved into newly created Shared Service Centres under the supervision of functional heads, with agreed service level targets. OE work has also expanded beyond corporate functions to delve into academic and research policies and processes that include the administration of examinations and admissions, bursaries and scholarships, among others.

To support the streamlining and improvement of corporate processes, new systems have been introduced. These systems include **LumiNUS**, the University's new Learning Management Platform, and a new **Lab Materials Purchasing Requisition System** for the purchase of lab consumables.

In the year ahead, we can look forward to even more system improvements such as:

- Enhancements to the **SESAMi procurement system** to facilitate catalogue buying;
- Replacement of the SAP HR system with a new **Cloud HR System (CHRS)**;
- A new **Grant Administration Management System** to improve grant administration experience for researchers across the grant life cycle;
- A new claims system **SAP Concur** to simplify and improve end-to-end claims process.

OE has been a challenging yet rewarding journey for the staff involved as they have learned to adapt to the demands of a rapidly changing operating environment. Many of them have received training in business process reengineering and are now equipped to lead and execute improvement projects.

Financial sustainability

As Singapore's flagship public university, we are fully committed to providing an affordable, high quality education to all our students, regardless of their financial background. We will also need to continually invest in infrastructure development for teaching and research excellence, engage in innovative strategic programmes, recruit the best academic talent and attract the best students.

Establishing a globally competitive university requires a steady flow of resources over time, and our strong pool of funds has helped NUS to keep our education affordable, as well as provide for our endeavours. To put us in good stead for the future, NUS must continue to build a strong endowment on par with the leading universities in the world. This will enhance the financial sustainability and stability of the University against external headwinds, and make an NUS education even more inclusive. A robust endowment will also enable the University to boldly pursue our ambitions for greater excellence in education and research.

For this, we are deeply grateful to our more than 80,000 donors for their partnership and support, and hope that more will continue to join us on our transformative journey.

Shaping the future

As members of the NUS community, I am sure we are all proud of how far the University has progressed. We have done well in 2019 and I thank you for your support and contributions.

I look forward to working with you as we continue to scale new heights in education, research and enterprise to shape a better future for Singapore and the world.

Yours sincerely



Professor Tan Eng Chye
President

