Professor Gene D. Block

Doctor of Laws, *honoris causa*
Citation

Leaders in higher education have more responsibility than ever in these uncertain times of rapid technological and social change, and in light of the existential challenge of securing a sustainable future for our world. Yet in such times there are also many opportunities, through education and new knowledge, to enrich all that it is to be human.

As they have in the past, universities play a key role in shaping the future, through our education, research and community services. This is the ecosystem within which we at this university operate, and to address those challenges and benefit from the many opportunities, we understand that it extends far beyond our campus and city, across borders, in both the collaboration and friendly competition that spur on the progress of our activities.

Institutions are, of course, made up of individuals. From the newest students to the person at the helm, each individual possesses the power to effect change. Collectively, they can nurture the university ecosystem and inspire those around them. Higher education leaders who manage to build a legacy that advances the sector, and serve as role models for their students and staff, the broader communities they serve, and their partners and competitors, are important to us all.

Today's honorand, Professor Gene Block, Chancellor of the University of California, Los Angeles, or UCLA, is such a leader, admired across the world of higher education for the tangible progress his institution has made during his 17-year tenure.

Professor Block is widely recognised as a steadfast advocate for high-quality, accessible public higher education – ideals that resonate deeply with our own values at CUHK. Since assuming the role of Chancellor in 2007, he has consistently prioritised academic excellence, civic engagement, diversity and financial security. Under his leadership, UCLA has enhanced its position as a leader in enrolling undergraduates from more disadvantaged, or traditionally underrepresented, backgrounds. For seven years, it has been the highest-ranked public university in the United States, according to U.S. News and World Report. And we at CUHK are proud to have become one of UCLA's international partners during Professor Block's leadership - UCLA being an institutional collaborator with the Asia Institute's Asia in the Humanities/Humanities in Asia Initiative, for example, and engaging in extensive student and faculty exchange with us.

Yet within the next few weeks, Professor Block, now 75, will be stepping down as Chancellor. He will be able to leave his post satisfied that UCLA is well-placed for its continued development. Its endowment grew from US$2.2 billion to US$7.7 billion during his tenure, in part due to a US$5.49 billion fundraising campaign – one of the largest ever undertaken by a public university – and there are plans Professor Block laid that will extend the university's physical footprint and influence throughout Los Angeles.

Two 'Grand Challenges' he set for UCLA to connect research to the greater good will continue. The first, Sustainable LA, is focused on transforming the city into a model green megacity; the second, the Depression Grand Challenge, aims to understand, prevent and treat depression, and halve its global health and economic impacts by 2050. The World Health Organisation has long identified anxiety disorders as the single biggest economic burden of ill health across the developed world. Two years before the COVID-19 pandemic, depression in the US was estimated to cost its economy more than US$326 billion a year, having increased in its prevalence by about one-third since 2010. It is a greater burden in the post-pandemic era.

Professor Block has addressed other challenges in his role, for example in taking a stand against antisemitism, racism and anti-Asian hate and bias, as well as defending LGBT+ rights.

Despite being in charge of an institution comparable to a small to medium-sized city – with close to 46,500 students, 8,000 faculty members and research grant income alone now reaching US$1.6 billion a year – Professor Block still finds time for his own research and teaching as a neuroscientist, work to which he will be devoting more time in the next phase of his career. Seemingly operating to his own high-energy circadian rhythm, retirement is not on his agenda.

The focus of his research should be of particular interest to the many of us who do not manage to get as much sleep as we need. He has made key discoveries about the biological workings of circadian rhythms across the sentient world, from the humble mollusk to the human. Currently, he is exploring the effects of aging on the nervous system and how it impacts biological timing in mammals, including humans. After leaving the Chancellor's role, he will continue this work through his faculty appointments in psychiatry and biobehavioural sciences at the David Geffen School of Medicine at UCLA and in integrative biology and physiology at the UCLA College of Letters and Science.

In his youth, Professor Block learned much about curtailed sleep. He was born in Monticello, New York, the grandson of immigrants from Hungary. His father and uncle owned Mountain Dairies and during his high school summer holidays, he would be up by 4 a.m. to deliver dairy products to summer camps and hotels in the Catskill area. He burnt the candle at both ends – on Saturday evenings he would play piano as part of a dance music trio in a resort. He was also an enthusiast for shortwave radio and still enjoys tinkering with his collection of about 50 antique radios.

Academia beckoned him away from the mountains. First came a bachelor's degree in psychology from Stanford University, during which the 19-year-old Gene Block memorably sat in on a course delivered by a young Lawrence Lau – a mutual pleasure for our former Vice-Chancellor and the Chancellor of UCLA to recall during CUHK's 60th Anniversary Banquet. It was followed by a master's degree and PhD from the University of Oregon. In 1978, he joined the University of Virginia, as a faculty member in the Department of Biology. Serving as vice provost for research from 1993 to 1998, and then vice-

president from 2001, he remained there until his academic career led him to UCLA.

He was also the founding director of the National Science Foundation's Science and Technology Center in Biological Timing. This centre's research has fundamentally changed our understanding of biological processes, such as the first identification, largely led by Joseph Takahashi, of the 'clock' gene in a mammal, namely a mutant mouse.

Professor Block's contributions to the development of higher education also extend far beyond the borders of UCLA, for example serving on the executive boards of the Association of American Universities and the Association of Public and Land-grant Universities. He is currently on the Steering Committee for the Association of Pacific Rim Universities, of which CUHK is a member. He is a member of the American Academy of Arts and Sciences, a fellow of the American Association for the Advancement of Science and a recipient of numerous professional awards.

One of the key roles of a leader is to empower others to succeed and lead. This is essential in a community as complex and enduring as a university. In this respect, Professor Block's greatest debt is owed to Carol, his wife of 54 years, who, as associate of the chancellor, has helped women flourish as leaders on campus, supported student artists and women's athletic teams, and hosted student recitals, among other initiatives. The contributions that such partnerships make are beyond price.

Mr Vice-Chancellor, it is my great honour to present Professor Gene Block, who we can so greatly admire as a champion of public higher education and the wider public good, for the award of Doctor of Laws, *honoris causa*.

Citation is presented by Professor Nick Rawlins, Pro-Vice-Chancellor / Vice-President (Student Experience) and Master of Morningside College

Professor James J. Heckman

Doctor of Social Science, *honoris causa*
Citation

Back in the early 1960s in the US, a young college student participated in the social upheaval of his day. Among other life-influencing activities, he witnessed the extremes of inequality in his country, on a road trip from Colorado to the deep south, with his Nigerian roommate. He was startled to see the fear among shopkeepers and hoteliers as the pair ignored the Jim Crow rules for racial segregation, when blacks and whites in those areas could not share the same park bench, bus or hotel, let alone education. He saw the effect of poverty and discrimination on the communities they passed through.

That experience became a key motivation for his lifelong concern about the status of African Americans and a determination to fight against the barriers to social mobility that many have faced, long after the formal end of racial segregation. It led to a 10-year research project that definitively established the importance of the 1964 Civil Rights Act on the status of African Americans.

Fast forward 60 years, that student continues to build on his passion and determination for understanding and addressing the causes of inequality, in black communities and beyond, in the US and around the world. He is today's honorand, Professor James J. Heckman, the Henry Schultz Distinguished Service Professor in Economics at the University of Chicago and a pioneer in the field of microeconometrics.

For the many in policymaking or philanthropists holding purse strings that he has influenced, such as the former US President Barack Obama, this is no dull, esoteric science but something that is vitally important for the

robust evaluation of public policies, and for identifying initiatives that will reap the greatest returns, for the individual and society. It provides necessary tools for all modern governments that are accountable to their populations, concerned with social justice yet constrained by limited budgets.

The difference Professor Heckman has made for public policy was globally acknowledged in 2000, when he shared the Nobel Prize in Economics for his work on the microeconometrics of diversity and heterogeneity within populations, and for establishing a sound causal basis for public policy evaluation. This is just one of numerous awards he has received, such as the Dan David Prize for Combatting Poverty, the Frisch Medal, and the Chinese government's prestigious Friendship Award.

Longitudinal studies of individuals' life journeys, from their pre-school years in the late 1960s and 1970s to the present, along with evaluations of various interventions, identify a clear root cause – and solution – for greater equity of opportunity. It lies in the earliest years, when the foundations for crucial cognitive and non-cognitive skills are laid. The data Professor Heckman has analysed from the Perry pre-school intervention programme and others demonstrate that with a sound start in life, children are more likely to flourish as adults, and contribute more to society. They also cost significantly less to the state in being more likely to avoid lives of crime, and having fewer health care needs, related, for instance, to obesity or the consequences of alcohol and tobacco dependence. Two of his latest projects, the China Reach that he has helped lead, and his novel analyses of the Jamaica Reach Up and Learn programme, build on this evidence, support the development of less advantaged communities in both nations, and act as models for others.

Professor Heckman is hence now renowned as a leading champion of early childhood education and development, in both pre-school and family settings. He has calculated that the return on public investment can be as much as 14 per cent, in terms of economic benefits for the individual and community. These advantages can be seen to be passed on through generations as the Perry pre-school children have become parents.

As a result of such evidence, pre-school education is no longer the Cinderella of schooling systems, including locally in Hong Kong where its professional upgrading and

funding support, targeting in particular the less privileged, have been an important element of education reforms.

However, Professor Heckman's studies extend beyond educational service provision. We also need to nurture effective parenting and child-care from birth, before inequalities – in particular in the non-cognitive skills that will beget more skills – set in. On this, tennis star Novak Djokovic is a disciple, unbeknown to Professor Heckman. The Novak Djokovic Foundation cites his research, and has chosen quality pre-schooling and parent education and support in disadvantaged communities as the focus for its work.

Professor Heckman has been highly vocal in his critique of policy obsessions with narrow academic scores and national rankings derived from the PISA study – the Programme for International Student Assessment run by the Organisation for Economic Co-operation and Development – as measures of the outcomes of education. The OECD seems to have heard and responded to his concerns, by inviting him to contribute to the study's new measures related to broader non-cognitive abilities, in his role as Senior Advisor for the PISA 2021 Questionnaire Expert Group. With Tim Kautz, he wrote the working paper, "Fostering and Measuring Skills: Improving Cognitive and Non-Cognitive Skills to Promote Lifetime Success", and advised the PISA board on the need to collect new character-related data.

Among the non-cognitive abilities that Professor Heckman has shown are at least as important as academic scores are motivation, perseverance and conscientiousness – character skills developed through childhood that are essential for a young person to build more skills and knowledge through their education, secure and retain a job, and go on to lead happy, more stable family lives. They would also have been key ingredients for his own achievements, across his life.

Professor Heckman was born into a humble and devoutly Christian family in Chicago before the end of World War II. At the age of eight he was already a "child minister", expecting the church to be his life calling. But during his high school years, in Lakewood, Colorado, he began turning towards more earthly academic interests. His intellectual curiosity was sparked by Frank Oppenheimer, whose brother Robert directed the Manhattan Project to develop the atomic bomb. Frank was barred from

working alongside his brother because of his Communist Party membership, and he retreated to a cattle ranch in Colorado from which he was initially persuaded to teach at a nearby school. Later, when he moved to Boulder, Jefferson, he became part of a programme to offer advanced teaching to a county-wide cohort of selected students. Bird and Sherwin's masterly biography of Robert Oppenheimer details the tensions between expertise, security and politics that led to this exclusion and to the post-war treatment of the Oppenhimer brothers. But one detail that does not emerge is that among the bright students who learned physics from Frank Oppenheimer was James Heckman, who has written of how he was inspired by his tutor to appreciate the power and beauty of experimental science, and that theories – however beautiful – must ultimately tie into empirical evidence.

While the Manhattan Project spawned Nobel Prize winners, its leader, Robert Oppenheimer was never one. Frank Oppenheimer is widely admired for having founded the San Francisco Exploratorium, to spread the public understanding of science. But it's good to know that in a period that he must have thought of as exile he also helped inspire another extraordinary mind who eventually won a Nobel Prize too.

The liberal arts education at Colorado College further sparked that student's curiosity, in subjects ranging from philosophy and history to mathematics – the discipline for his bachelor's degree – and eventually economics. He gravitated towards the latter because of its practical power to address socio-economic challenges in society, he has said. He went on to complete his MA and then PhD in economics at Princeton University. His thesis focused on labour supply and the demand for goods.

After spending early periods of his career at New York and Columbia Universities, the University of Chicago has been his academic home since 1973. There, he was one of the founders of the Harris School of Public Policy and in 2014 launched the Center for the Economics of Human Development, which he continues to direct. He also holds an appointment with the university's law school.

Professor Heckman's work is grounded in economics, but to get to the heart of major socio-economic problems, he well understands that it is essential to draw in

other disciplines, a lesson learnt, in part, from his late wife, the sociologist Lynn Pettler, who he married in 1979. Together they raised a son and a daughter, who have followed in their parents' footsteps by both becoming successful academics. In 2010 he set up the Human Capital and Economic Opportunity Global Working Group, now an international network of over 500 scholars that he co-directs, as the platform for collaboration in fields ranging from genetics and epidemiology to psychology and neuroscience. In this and his many other appointments, he has been extraordinarily prolific, the obvious measures being the more than 370 academic papers and nine books, such as *The Myth of Achievement Tests: The GED and the Role of Character in American Life*, and *Giving Kids a Fair Chance*, to his name.

Professor Heckman has also shared his expertise with this university in Hong Kong, as Distinguished Professor-at-Large with the Lau Chor Tak Institute of Global Economics and Finance, while he and the University of Chicago's Center for the Economics of Human Development have particularly fruitful on-going collaborations with researchers in mainland China. Work with Jinan University's Institute for Economic and Social Research and the China Development Research Foundation helps guide Chinese policies in strengthening early childhood education and development, and addressing other areas of inequality. This has been developing initiatives in impoverished rural areas, and contributing further evidence of conditions for human flourishing, a partnership that has made him a special friend of China as reflected in the Friendship Award he received in 2019.

Professor Heckman is a friend, of the numerous students, colleagues and collaborators who have benefited from his extraordinary wisdom, energy and support; of the decision-makers and many in public policy who use the fruits of his work; and of the children whose lives he has improved – particularly those born into more disadvantaged circumstances. Mr Vice-Chancellor, it is my great honour to present Professor James J. Heckman, who has given so much as a most eminent friend for humanity, for the award of Doctor of Social Science, *honoris causa.*

Citation is presented by Professor Nick Rawlins, Pro-Vice-Chancellor / Vice-President (Student Experience) and Master of Morningside College

Sir Paul M. Nurse

Doctor of Science, *honoris causa*
Citation

On the 21st of January 1665 my sevenfold-great-uncle Samuel Pepys stayed up notably late – until well after midnight. He was reading a large and sumptuous book he had just acquired. It was written and illustrated by Robert Hooke and had just been published, under the auspices of the Royal Society. It was called Micrographia, and it contained very large drawings of very small things as viewed through a microscope. Pepys wrote that it was 'the most ingenious book that ever I read in my life'. Its remarkable drawings (Hooke had been apprenticed with Lely, the leading court portraitist of his time) made it a best seller – the human flea is an extraordinary, if alarming, creature when seen vastly magnified– but perhaps the most influential illustration is much less artistically striking. It shows the appearance of a thin slice of cork which, when magnified, resembles the structure of honeycomb – so much so that Hooke called the tiny box-like structures of which cork is composed, 'cells'. It was the first time that anyone had seen and reported on these tiny, yet crucial, biological units.

The life you can see around you, whether moss or redwood and from gnats to whales, starts out the same way: as a single cell. It doesn't matter whether we're destined to be gigantic or tiny. We grow to our adult size through successive cell divisions. But what determines whether or not a cell will divide into new cells, which themselves divide into yet more cells and so on? Why don't they go on for ever, proliferating exponentially? Proper control is essential for normal growth: we not only need to start growing, but we also need to stop

at the right point. The ‘cell cycle’, which controls whether or not cells divide, is thus central to normal development. Failures might not only make us the wrong size, or wrongly proportioned; cancers, too, are a form of uncontrolled cell proliferation. So understanding how it works, and how it can go wrong, is a central question in biology. Professor Paul Nurse’s experimental life has been dedicated to resolving this question. It wasn’t all plain sailing.

Paul Nurse was born in Norfolk but while he was still young his parents moved to the Greater London district. There he attended a primary school which he distinctly enjoyed and to which he walked each day. That journey, often made on his own, took him through some undeveloped land and across a large park and what he saw around him – and above him – kindled his interests in the natural worlds of biology and astronomy. He passed the national eleven-plus exam which split secondary schooling into two streams and sent him to the nearby grammar school, which lay within the highly selective and academic branch of the English school system of that era. Yet it was, for various reasons, less welcoming than the place he had left. He nonetheless retained and developed his interest in biology, and was good at it. That should surely have taken him to university. But he wasn't good at French.

You may well wonder why that should matter to a would-be biologist, but it did. Successful applicants to a UK university in the 1960s needed not only to be proficient in their specialist subject but also to have a basic modern language qualification – most commonly French, which was widely taught at school. If your French wasn’t good enough, it didn’t matter how good you were at your actual degree subject: you wouldn’t get a place. In some ways that was an admirable requirement for a literally insular nation lying a short distance from the European mainland. But it could also be disruptive. For the young Paul Nurse it meant that his initial route to biological research was through working as a technician rather than becoming an undergraduate. His workplace was a microbiology laboratory. It belonged to the Guinness company – a distinctive giant among brewers. And brewers know a lot about yeast.

Making beer is both an art and a science that humans have practiced for thousands of years. The principle is simple: extract sugars from grain to make a sweet liquor, and add yeast, which ferments it into alcohol. Strains of the same saccharomyces species make the alcohol in beer and wine, and the bubbles in bread. A lot of work has gone into finding strains that give quick (or slow) fermentations, or impart different flavours, or can be dried and reconstituted so that we get the tastes, textures, and convenience that we want. But beyond that, yeasts have become very important to microbiologists, because they are eukaryotes, which means that they are representative of plants and animals generally, yet they are also single cell organisms. That makes them easy and safe to grow, maintain, manipulate, and study in a laboratory, so much so that that some consider them the ideal model organisms for modern molecular biology. Finding oneself in a brewer's laboratory could thus offer more opportunities than just the raw material for parties. As things turned out, Paul Nurse's basic duties in the Guinness laboratory took up only two days a week – outside that, he conducted his own research. This was because he had a perceptive lab head who could spot talent and saw it, and found a way to encourage it. The results captured the interest of a Professor at Birmingham, called John Jinks, who found a way to make a place available – French or no French. History has demonstrated that it was a seriously good decision.

Birmingham provided not just intellectual excitement but also an opportunity to explore possible futures in biology. Ecology? Fascinating in theory, but far too cold in practice out in the field (or more specifically, in the sea: laboratories represent a more comfortable environment both for experimenters and their subjects). Animals? Paul Nurse's first introduction to that cell cycle which became his research life was through undertaking a project on the division of fish eggs – but one that he characterises as having been 'disastrous'. Plants? Perhaps they might offer a better way into developmental biology. So that was the initial route that he took – though turning his research programme into the extraordinary success that it eventually became took time, travel, flexibility – and resilience.

From Birmingham he went to the University of East Anglia as a research student studying

molecular changes during the cell cycle – which took him back, once more, to yeast. At times, he found the sheer difficulty of making progress in experimental research deeply disheartening, but he stuck with it and started to plan a post-doctoral career developing further ideas for using a genetic approach to understand cell reproduction in yeasts. This meant building on a genetic approach pioneered by Lee Hartwell in the US, but translating it into a different yeast species – which itself meant mastering and combining techniques developed in two further laboratories – one in Switzerland and the other in Scotland. Yet within a matter of presumably fascinating yet frantic months, the key connections were made and the new project was up and running; from it emerged the identification of a key controller of the yeast cell cycle, the cdc2 (or cell division cycle 2) gene. From this, and from its connections to work going on in other model systems, developed a cascade of further experiments and observations, including his own team's identification of the human version of the gene. In 2001 this extraordinary body of work was recognised by the award of a Nobel Prize, shared with Tim Hunt and Lee Hartwell for their discoveries of 'key regulators of the cell cycle'. Paul Nurse – by then Sir Paul Nurse – was 51. If he hadn't told us how hard it was at times that brief summary would make it look as easy as floating among the clouds (which, as a serious glider pilot, he can tell you isn't as easy as it looks either).

The autobiographical details that tell his story on the Nobel Institute's website exemplify eloquence and generosity, and end with a startling coda, which you should read for yourselves one day. He conveys not only a passion for science – both its beauty and its practical importance – but also a deep sense of our responsibilities as communities of scientists. The exceptional importance of his research has led to honours and awards far too numerous to list here, and I shall touch only on a small subset of the positions he has held, plus one that he didn't hold: years ago, I tried to persuade him to return to Oxford to take up a Statutory Chair; I failed. In the event, his still grander roles as President of the Rockefeller University, his appointments in the major cancer research charities in the UK, his current position as Director of Europe's biggest biomedical laboratory, the Francis Crick

Institute in London – as well as his time as President of the Royal Society, an office once held by Samuel Pepys, with whom I started this citation – all reflect widespread recognition and deep appreciation of his commitment to science, to education more generally, and to humanity. I represent the admiration of many when I say:

Mr Vice-Chancellor, it is my great pleasure and my honour to present Sir Paul Nurse for the degree of Doctor of Science, *honoris causa.*

Citation is written by Professor Nick Rawlins, Pro-Vice-Chancellor / Vice-President (Student Experience) and Master of Morningside College

Professor Pan Jianwei

Doctor of Science, *honoris causa*
Citation

In ancient China, Lu Ban, a master craftsman of the Spring and Autumn period, once carved bamboo rods to make a magpie that could fly non-stop for three days, and proudly proclaimed it as an ingenious and magnificent creation. Later, Micius, a great philosopher in the Warring States period, had a different perspective. He believed that it would be more meaningful to carve three inches of wood and transform it into a cart axle capable of carrying a cargo load equivalent to fifty pieces of stone. Upon hearing Lu Ban's boastful remarks about his bamboo magpie, Micius sighed and said: 'Any means that benefit people are truly ingenious, while those that do not are merely clumsy.' In other words, a technology or invention that benefits people is considered ingenious, while that fails to do so is deemed uninspiring. A renowned quantum physicist, Professor Pan Jianwei is not only a pioneer and expert in the field of experimental quantum information but has also effectively applied his theoretical knowledge to benefit our nation and the world at large. This particular skill set of his can be aptly acknowledged as ingenious, and it is not an exaggeration to say so.

Born in Dongyang, a city in Zhejiang province, Professor Pan completed his undergraduate and master's degrees in the Department of Modern Physics at the University of Science and Technology of China (USTC). Following his graduation, he pursued further studies in experimental physics at the University of Innsbruck in Austria, and later continued his studies at the University of Vienna (UV).

After obtaining his PhD, he continued his research at UV as a postdoctoral fellow and senior researcher. In 2001, he returned to China and joined his alma mater as professor in the Department of Modern Physics. Ten years later, he was already elected member of the Chinese Academy of Sciences (CAS). At present, he is the Executive Vice-President of USTC and concurrently Director of CAS Center for Excellence in Quantum Information and Quantum Physics.

Micius conducted the first-ever pinhole imaging experiment in human history and formulated the 'Eight Principles on Optics'. Through this trailblazing experiment, he discovered that light travels in straight lines, thus laying the foundation for modern quantum optics. Fast forward over two thousand years, and Professor Pan has managed to make similar remarkable discoveries in the field of optical science. His research mainly focuses on quantum optics, quantum information, and fundamental issues in quantum mechanics. By employing quantum optical techniques, he has achieved significant breakthroughs in quantum control, showcasing exceptional insights and exquisite techniques. His contributions to experimental research in quantum information have made this field to be one of the most rapidly advancing disciplines in physics in recent years.

After his time in Europe, Professor Pan returned to China and played a pivotal role in establishing a quantum information laboratory at USTC. As early as 2003, while most people were still engrossed in proof of concept demonstrations within the laboratory, he had already conceived the idea of achieving integrated space-to-ground quantum communication network through satellites, outlined the blueprint for global quantum communication, and embarked on a series of pioneering experimental research. On 16 August 2016, the world's first quantum satellite Quantum Experiments at Space Scale (QUESS), named Micius, was launched. Professor Pan once remarked: 'Micius is a great ancient scholar in optics, while the technologies our research team uses for quantum communication and quantum satellite are based on light or photons. Naming this quantum experimental satellite after Micius not only pays due respect to this

prodigious ancient optical scientist but also demonstrates the self-confidence of our country in scientific research.'

Quantum communication, built upon the fundamental principles of quantum physics, possesses a unique advantage in overcoming the inherent security vulnerabilities of conventional encryption techniques. As a result, it stands as the most secure method of communication currently available. This groundbreaking technology represents an ingenious achievement in communication methods and holds immense potential in addressing cybersecurity concerns across various fields, including defence, finance, government affairs, and business. As of today, the greatest challenges faced by scientists remain security with realistic devices, expanding long-distance communication capability, and enabling practical applications of quantum communication. These tasks are onerous, but they are also incredibly intriguing. Through the pioneering experiments conducted by the Micius satellite, Professor Pan has taken a leading role in advancing satellite-based quantum science. This novel and ingenious endeavor has demonstrated the feasibility and reliability of long-distance quantum communication through satellites, and solidifying China's leading position at the forefront of space-level quantum experiments.

The success of the QUESS mission has enabled Professor Pan's team to delicately master the manipulation of photons, propelling progress in the field of photonic quantum information processing. Beginning in 2020, his research team began developing the Jiuzhang photonic quantum computer prototype, named after the ancient Chinese mathematics book *Jiu Zhang Suan Shu* (or *The Nine Chapters on the Mathematical Art*). Since then, the Jiuzhang computer has consistently gone through upgrading, showcasing its quantum computational advantage, surpassing even the most powerful supercomputers when solving specific problems. Professor Pan's research team has undeniably achieved eminence in the realm of quantum computing, intertwining the ingenuity of ancient epochs with the breakthroughs of the modern era, garnering acclaim all over the world.

The Micius satellite and Jiuzhang computer are undoubtedly distinct from the flying magpie by Lu Ban, but their practical applications bear close resemblance to Micius' use of carved wood for a cart axle, all bringing enormous benefit to the country and its people. In today's world, we can harness the ingenious inventions of Professor Pan to transmit safely vast amounts of information at lightning speed. Such astounding and ingenious inventions not only help bolster China's standing in the international scientific sphere, but also bring enormous benefits to humankind.

The innovative research achievements by Professor Pan have had a profound global impact, and have also brought him numerous accolades. He has received multiple international awards, including the International Quantum Communication Award from the International Organization for Quantum Communication, Measurement and Computing, the Newcomb Cleveland Prize from the American Association for the Advancement of Science, the R.W. Wood Prize from the Optical Society of America, and the ZEISS Research Award from the Carl Zeiss AG, Germany. In China, he has been honored with the National Prize for Natural Science Award (First Class) , Future Science Prize in Physical Science and the Pioneer Medal of Reform for his innovative work in quantum information research, among other national awards and titles. Currently, Professor Pan serves as Vice-President of China's Jiusan Society, an association set up on 3 September 1945 with the mission to pursue political, economic, and social progress in the nation. He is also a member of the National Committee of the Chinese People's Political Consultative Conference. Through these important roles, Professor Pan continues to make valuable contributions to society and his motherland.

Emerging quantum capabilities, strengthening the nation.
Ingenious innovative research, astonishing the word.

Mr Vice-Chancellor, Professor Pan's audacious research has propelled China to the forefront of quantum information and communication, garnering recognition both nationally and internationally. His unwavering dedication and boundless

passion for scientific pursuits have transformed China's role in quantum physics from a mere follower to an extraordinary pioneer, deserving resounding acclaim. Within the scientific community, Professor Pan's remarkable advancements have driven the progress of quantum technologies, benefiting not only the global community but also future generations. In acknowledgment of his innovative scientific research and invaluable contributions to the nation and its people, Mr Vice-Chancellor, I have the pleasure to present to you Professor Pan Jianwei for the award of Doctor of Science, *honoris causa.*