What damage oil spills at sea can do, a new species of marine bacteria can now avert. And these tiny single-cell organisms with an insatiable appetite for naphthalene, a common constituent in petroleum hydrocarbons, may just turn out to be our environment’s best friend.

Isolated from oil-contaminated beach sediments in Singapore, the strain – MN-003 – was discovered after three years of research by a four-man team at the Environmental Engineering Research Centre (EERC). Prof Tay Joo Hwa, Asst Prof Stephen Tay, Dr Maszenan bin Abdul Majid and Mr Zhuang Weiqin confirmed through DNA-sequencing that MN-003 belonged to a new bacterial species. “Like parents naming their babies, we had the privilege of naming the new bacterial species, and decided on the name Bacillus naphthovorans because the bacterium had a voracious appetite for naphthalene and other petroleum constituents,” said Asst Prof Tay. This is the first time that researchers from NTU’s College of Engineering have characterised and named a bacterium.

Different species of bacteria require different environmental conditions for growth. So while petroleum-degrading bacteria isolated from colder regions (such as in Alaska) may be just as oil-crazy as Bacillus naphthovorans, they are unlikely to thrive in the tropics where it is hot and humid. Which makes Bacillus naphthovorans a truly valuable discovery. In fact, the local wastewater industry has already expressed interest in the commercialisation of this bacterium to clean up oil contamination here.

For now, Bacillus naphthovorans will be deposited with the prestigious American Type Culture Collection, a neutral non-profit organisation responsible for the safe keeping of valuable cells and microorganisms. EERC Director Prof Tay, a member of the bug-hunting team, said: “We are actively isolating and studying more and more novel strains of environmentally important bacteria. With the aid of life-science techniques, we are increasing our knowledge of how they function to make the environment safer and cleaner for everyone.”

Naphthalene-devouring Bacillus naphthovorans, recently added to the world’s list of known bacteria (scale bar represents 2 microns)

Happy bug-hunters (from left) Dr Maszenan bin Abdul Majid, Mr Zhuang Weiqin, Prof Tay Joo Hwa (holding a flask of Bacillus naphthovorans culture) and Asst Prof Stephen Tay

Found: Novel oil-eating bacterium

Bacillus naphthovorans, discovered and named by NTU researchers, are hungry grease-guzzlers that can rid our seawaters of oil pollution and protect marine life.
Graduate students enjoy privacy in new on-campus residence

Keen competition for a room at the Graduate Hall, a place mature students can call their own

Many like research student Erwin Leonardi from Indonesia applied for a room at the Graduate Hall, the newest residential building greeting visitors to NTU near the Jalan Bahar entrance. The Hall’s main selling point? Its 364 single rooms with attached bathrooms.

Just as inviting – its condo-style look and lush green surroundings, plus the affordable rental prices.

“I like the facilities best, such as the private bathroom and new furniture,” said Erwin.

According to the Office of Academic Services (OAS), top on mature students’ wish list for on-campus accommodation is privacy. OAS, which handles the Hall applications, said that students were pleased with the fact that all 422 units, including 58 double rooms for married couples, come with an attached bathroom. The monthly rental rates are also competitive – $350 for a single room and $575 for a double room. The lease is for a year.

NTU, which created the world’s biggest campus-wide wireless network in 2000, has enabled wireless surfing of the Internet within the Hall compound. Run as a self-sufficient centre, the Hall comes equipped with three laundry rooms and three pantries. Students can relax in a common lounge in the basement.

More than 450 graduate students have sought places since applications opened on 8 May 2002. As of 25 June, 85% of the rooms have been taken up. Due to overwhelming demand, foreign research students were given first priority. Applicants with a spouse studying in NTU were also considered first.

Fighting flab the high-tech way

Monitoring your calorie intake, fitness level and emotional well-being is now a piece of cake – with NIE’s patented PDA-based invention, a world’s first

Five professors from NIE wanted to help the Ministry of Education tackle a real problem – rising obesity among schoolchildren – and started cracking their brains for answers. Their eventual solution? The HealthTrek Information Tracking System, or HITS, which happens to be the first of its kind in the world.

The five teacher-innovators are Assoc Prof Chia Tet Fatt from Natural Sciences, Asst Prof Joyce Mok from Science & Technology Education, and Assoc Prof Quek Jin Jong, Asst Prof Michael Chia and Asst Prof John Wang, all from Physical Education & Sports Science (PESS).

Packing a nutritionist, exercise physiologist and exercise psychologist into one handy hand-held Personal Digital Assistant (PDA), HITS tracks health and wellness in real time. Users such as obese schoolchildren or weight-conscious adults simply record what they eat, what exercise they do and how they feel on the PDA. The system then responds with concrete advice based on specific health goals. For example, aware that you need to lose 3 kg to maintain healthy weight, it may advise you to choose fishball noodles over laksa for lunch, or to increase your physical activity with some form of regular exercise.

Developed over a year in collaboration with technical partners IBM Singapore and Sony Singapore, HITS is the maiden IT product of Ability Driven Education Pte Ltd (ADE), the commercial arm of NIE. It is currently being sold to schools for use by obese schoolchildren under the supervision of their teachers and parents.

The inventors hope to add heart rate and blood pressure monitoring to the system before releasing it to the public by year’s end. They are also exploring adapting the HITS software for preventive healthcare and lifestyle management.
All set to reinvent healthcare

NTU is working hand in hand with the University of Washington to make strides in tissue engineering and home healthcare.

Bioengineering is one of the fastest growing fields of research worldwide, and the successful commercialisation of bioengineered materials and devices could rake in billions of dollars per year in revenue for the economy.

So the establishment of the Singapore-University of Washington Alliance (SUWA) on 13 May holds much promise for both NTU and Singapore. The five-year research partnership between NTU and the University of Washington (UW) – one of USA’s top ten universities – is funded by the Agency for Science, Technology and Research (A*STAR).

The collaboration will kick off with two research initiatives – in engineered biomaterials and tissue engineering, and distributed diagnosis and home healthcare (see inset). It is hoped that these will spin off new biomedical technologies. Within NTU, the multidisciplinary Biomedical Engineering Research Centre is expected to take the lead. The centre, which works closely with major hospitals, is outfitted with its own laboratories for instrumentation, biomedical signal and image processing, and tissue engineering, to name a few examples.

NTU President Dr Cham Tao Soon said that the idea for the partnership took root after frequent meetings with UW. Eventually, both parties submitted a proposal for the Singapore-UW Alliance to the Biomedical Research Council (BMRC), the life sciences research arm of A*STAR.

Prof Louis Lim, Executive Director of BMRC, said: “The Council is supportive of this collaboration between Singapore, initially through NTU, and the University of Washington. They clearly complement each other with their strong research expertise and experience in this field.”

The Bioengineering Department in UW is rated second to none in terms of funding from the US National Institutes of Health in 2001 – 2002. The department alone has generated 362 inventions, more than 200 patents, and 23 start-up companies.

Advancing healing and home healthcare technologies

The new NTU-UW partnership could lead to research of life-changing significance and the commercialisation of exciting new biomedical technologies.

Growing new possibilities in tissue engineering

NTU and UW researchers will regenerate in the laboratory customised human tissues and organs to replace diseased or damaged ones. For example, the team will develop a novel tissue-engineered pharynx and gullet, offering new hope for throat cancer patients. Through a better understanding of the biology of healing, the researchers will also engineer new biologically-compatible materials and processes that promote healing.

Transforming public healthcare

While UW has been accelerating the development of new diagnostic techniques and treatments, NTU has been very active in medical instrumentation and telemedicine. Pooling their complementary expertise, NTU and UW researchers will develop a handheld home ultrasound system, instrumentation systems for patient monitoring and communication via e-Medicine, and point-of-care immuno-diagnostic systems. The result will be greater accessibility of integrated healthcare tools outside the lab, transforming healthcare as we know it today.
NTU’s expertise in nanotechnology sought

The School of Materials Engineering is helping a major industry player to find new ways of synthesising and processing rare earth materials

The future of nanomaterials is hot, and NTU is getting an even bigger slice of the action with an exciting new tie-up.

In a continuous effort to improve their R&D capabilities, and recognising the expertise of the School of Materials Engineering (SME) in nanotechnology, AMR Technologies, one of the world’s largest producers of engineered materials made from high value-added rare earths, is working with the School to develop more cost-effective methods of synthesising nanomaterials.

AMR’s decision to leverage SME’s existing strength in nanotechnology is backed by the Economic Development Board and Agency for Science, Technology and Research (A*STAR), which have both pumped in additional project funding and manpower amounting to $1 million. SME Dean Prof Fong Hock Sun and AMR Chairman Mr Peter Gundy formalised the tie-up on 28 May.

AMR Technologies Inc, an international technology company with a sales turnover of around US$50 million in 2001, produces a line of advanced rare earth, zirconium and magnetic industrial products. These are used to manufacture goods that are stronger, cleaner, lighter, smaller, brighter and faster.

Because nanomaterials have an average grain size of less than 100 nanometers (one billion nanometers equals one metre), they have some amazing and, in some cases, novel properties. Significant enhancement of optical, mechanical, electrical, structural and magnetic properties are commonly found with the use of these materials.

All charged up and set in motion. That’s NTU and the Institute of High Performance Computing (IHPC). Both recently joined forces to establish a new research programme in computational electromagnetics called the Programme for Electromagnetics (PEM).

Prof Er Meng Hwa, Dean of the School of Electrical and Electronic Engineering (EEE), and Prof Lam Kin Yong, Director of IHPC, formalised the partnership, which was launched to the tune of $1m.

Computational electromagnetics is the science of using high performance computing to simulate the physical interaction between electromagnetic waves and material structures. Only by understanding this phenomenon can we predict the performance of and competently design microwave, optoelectronic, and microelectronic devices for a diverse range of applications.

In the first three years, PEM will focus on evolutionary computation for electromagnetics, electromagnetic modelling of broadband packages for optical communications, and the investigation of on-wafer coupling and cross-talk effects of CMOS RF ICs. Helming these three projects are EEE dons Assoc Prof Lu Yilong, Asst Prof Shen Zhongxiang and Assoc Prof Ma Jianguo, respectively.

Boost for satellite project

A smoother launch – that’s what NTU’s micro-satellite, X-SA T, will likely get in 2007 with the recent donation of structural and thermal analysis software worth US$90,400 from MSC Software, a leading global provider of simulation software.

Assoc Prof Graeme Britton, team leader of the Mechanical Group at the Centre for Research in Satellite Technologies (CREST), is delighted with the software, which is also used by NASA, the Indian Space Research Organisation (ISRO), and many other aerospace organisations. This is important because NTU-developed analytic models must be sent to the launch agency for coupled load analysis before the satellite is launched. By using the same software as the launch agency, NTU models can be easily incorporated with those of the launcher, reducing errors and saving time and effort.
Partnerships

Bold new business partnerships

The Nanyang Business School is collaborating with top business schools worldwide in executive education

The Nanyang Executive Programme (NEP), established under the Nanyang Business School, offers professionals from all walks of business a chance to update themselves through custom-made programmes, and more recently, open enrolment programmes. These popular programmes seek to impart new business practices and management strategies.

To boost executive education at NBS, NEP has been actively cultivating partnerships with established business schools in USA, Europe and Asia. One such collaboration is with the Australian Graduate School of Management (the number one business school in Australia) to offer an executive development programme in Negotiation and Conflict Management Dynamics this July. Another collaboration scheduled for September 2002 is a joint marketing programme with the Richard Ivey School of Business in Canada (Ivey’s custom executive education programmes are ranked among the top 20 worldwide).

Most recently, NEP has renewed an agreement to provide 30 students from the Norwegian School of Management with a comprehensive one-year executive programme drawing on the expertise of its faculty. The course includes the completion of a very demanding “diploma project” which involves case studies of Norwegian companies operating in Singapore.

Ivan Ng and his schoolmates from the Japanese Appreciation Club (JAC) in NTU have been building firm bridges with their Japanese counterparts through yearly homestay programmes.

The students even tied up with a government town council in Miyazaki Prefecture to organise a 10-day homestay and immersion programme for 11 club members in May this year.

Meeting the mayor of Miyazaki during a formal meeting was privilege enough for the students. Even better was the deal they struck with the mayor and his officials for more such collaborative exchanges. In fact, both parties plan to sign an MOU for long-term collaboration in cross-cultural exchange, said Ivan, who is the President of JAC.

JAC has been organising homestay programmes for its members for the past three years. This is the first time that a government organisation in Japan has been invited to be a co-organiser.

Miyazaki Prefecture, facing the Pacific Ocean, has lush greenery, snowy mountains and tranquil rivers. “Every undergraduate was attached to a different host family and hence had different experiences. Some hosts are farmers, teachers and officials working in the town council,” said Ivan. The exciting trip, which received publicity in the Japanese newspapers, ended with a grand farewell party organised by the town council, and accommodation at a European-style green tourism cottage.
e-Pawn, Singapore’s first online pawn network?

Updating an old trade – pawnbroking – gets the thumbs-up in Asia’s leading graduate school business plan competition

A team of four MBA students from the Nanyang Business School (NBS) showed how modern technology could be used to reinvent the pawnbroking industry. For that, they walked away with a US$1,000 prize in the Asia Moot Corp 2002 Business Plan competition.

The Asia Moot Corp competition, which aims to launch new companies as well as build and strengthen entrepreneurship business education, attracted 14 teams of MBA students from some of the most prestigious business schools in universities from Japan, China, India, Taiwan, Thailand, Korea and Singapore. It was held in Honolulu from 13 – 15 March at University of Hawaii’s College of Business Administration.

The NBS team won one of five awards with their e-Pawn Network idea. The team’s vision is to be the leading information resource, trade exchange platform and preferred electronic enabler for the pawn industry. Four products and services – e-Resource, e-Trade, e-Auction and e-Enablement – were created to address current inefficiencies in the pawn industry.

Prof Vijay Sethi, who supervises business plans as a part of the MBA programme, selected the e-Pawn idea – one of 50 concepts presented in his class on IT and Electronic Commerce – to represent NBS. “Jeffery and his team-mates not only met up with Mr Ivan Ho, Chairman of the Pawnbrokers Association in Singapore, but also worked very closely with him in this business plan. They even videoed one of the auctions in the hotel,” he said.

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Roderick Chia has a lot on his hands these days as head of a new association for the entrepreneurially-charged. But the NTU alumnus and current student of the Nanyang Technopreneurship Centre’s new graduate diploma Technopreneurship and Innovation Programme (TIP) is no stranger to a life of action and innovation. He has won the Tan Kah Kee Young Inventors Award five times, co-founded two companies, and directed and managed several others.

On 1 June, together with a group of other young entrepreneurs, he launched the Innovators and Entrepreneurs Association.
Cool concept: Oases in the Indian outback

Amod Kumar Agarwala, a final-year student from the School of Electrical and Electronic Engineering, and NTU alumnus Rohit Dugar want to give weary highway travellers in India some respite. They have taken the first step with a US$5,000 prize-winning business proposition – DriveWays Inc.

The team had been floating ideas for the inaugural Lee Kuan Yew Global Business Plan Competition organised by the Singapore Management University. On a trip to Delhi last November, Rohit, a consultant with Hewlett-Packard, found that highway travelling in India left a lot to be desired. “There are hardly any stop-over joints or restaurants along major inter-city roads. This presents a huge gap in the Indian hospitality industry which we can fill,” he said.

So, capitalising on their complementary skills in marketing and financial analysis, the duo researched and brainstormed to hone their concept of Indian highway hospitality. Their business model, Amod said, would be enabled by new national highway projects in India, as well as the country’s burgeoning automobile, hospitality and tourism industries.

The idea is to build, through strategic alliances, clusters of DriveWays establishments along major inter-city highways. Each would house – under one roof – a resting lounge with eateries, a hotel and other recreational facilities and tourist services.

The Lee Kuan Yew Global Business Plan Competition, the first international business plan competition of its kind, attracted 202 entries from more than 500 students from 74 universities across 19 countries. DriveWays was one of six finalist teams from tertiary institutions in Canada, USA, Indonesia and Singapore that survived to the last stage of the prestigious three-tiered competition.

Rohit (left) and Amod said they enjoyed working together on the business plan

EA TIP student Roderick Chia, President of the Innovators and Entrepreneurs Association (IdEA), is fuelling an idea-generation (IdEA), which has roots in The Innovators Club (1994 – 1999) and, more recently, the Association of Technopreneurs (1999 – 2002). Roped in to spearhead the club’s second transformation, Roderick garnered support and resources for its restructuring, brought in a new partner – CommerceNet Singapore Ltd – and is currently doing his utmost to help fire up a new generation of local innovators and entrepreneurs.

IdEA is more than an invigorating platform for information exchange; it is also an empathetic nurturer, he said. “For every success story you have heard, there are ten or more not-so-fortunate stories that you have missed. We should be out there to give them encouragement and support by being more tolerant of failure.” The club also supports the ongoing Innovation Programme administered by the Ministry of Education’s Gifted Education Branch.

If one idea leads to another, and many to a multitude, why not show the public what bright ideas are out there – and on National Day to boot? This could well be the idea behind a national innovation festival which Roderick and his team are planning for this August.

Want to join IdEA? Email Roderick at Roderick@idea.org.sg or visit http://www.idea.org.sg to enrol as a member.
A physics extravaganza like no other

NTU, the “games village” of the 3rd Asian Physics Olympiad (APhO), recently sizzled with the energy of some of Asia’s brightest physics whizzes

It was a mini United Nations gathering of sorts, with 107 students from 15 countries converging for the greatest physics extravaganza this side of the globe.

For these participants of the 3rd APhO, the shared pursuit of physics entailed more than just playing physics games and enjoying analytical discussions with esteemed physicist Professor Roberto Peccei (Vice-Chancellor of Research, UCLA) at a special public lecture. It also meant clearing two hurdles and the raison d’etre of the Olympiad – a theory exam at NTU and an experimental exam at NUS, each five hours long.

Held for the first time in Singapore from 6 – 14 May, APhO is the sister competition of the International Physics Olympiad (IPhO), the world’s premier physics competition for pre-university students. NTU, the National University of Singapore (NUS), the National Institute of Education and the Ministry of Education jointly organised this year’s competition.

In between the gruelling tests of physics wit and problem-solving, the student delegates, who stayed in NTU’s Halls of Residence 10 and 11, managed to soak in Singapore’s culture and its many attractions.
Terrific teachers

On 20 April, the University’s teaching community gathered to salute their outstanding peers, each voted “Teacher of the Year” by their students.

“The students have chosen these teachers because they demonstrate such dedication and commitment to achieving excellence in teaching,” said NTU President Dr Cham Tao Soon at this year’s teaching “Oscars”.

So how did each of our exemplary teachers snare the prestigious title? All were modest about receiving the honour, but most were willing to share what they thought were their strengths and winning ways. “I think it’s very important to create an environment where you’re their friend,” offered Assoc Prof Lalit Kumar Goel, a second-time winner. He added that he has always practised an “open-door policy” – students can go to him for advice anytime.

Asst Prof Gan Su-lin motivates her students by helping them to expand the definition of success – important in stimulating creativity. “We must try to stop imposing wide-ranging prescriptions for what is and is not considered acceptable,” said the professor, who is known as “The Lollipop Prof” for her habit of rewarding her students with Chupa Chups.

Assoc Prof Lachlan Crawford said his sense of humour probably helped him win (twice – he is a second-time winner), while Asst Prof Ng Swee Fong strikes a chord with her students by helping them “unlearn to learn”, as one appreciative student put it. Others cited tips such as “giving time to the students”, “making lectures interesting and very down-to-earth”, “using cartoons” and “teaching with enthusiasm”. But, at the end of the day, you have to know your stuff inside out, and make it accessible, too. “Perhaps I was able to convey salient points in a manner that made sense to the students,” conjectured Assoc Prof Thambipillai Srikantan, who is also well liked by his teaching peers.

The Teacher of the Year Award is the highest teaching honour any teaching staff of the University can receive. The 11 winners, from NTU and NIE, were selected based on students’ feedback ratings of their lecturers over the past few years, followed by a short-listing of nominees by Deans/Heads and student leaders. The short-listed candidates were then forwarded to final-year students for voting.

“...your role is to help these young physicists view the world with curiosity, open-mindedness, and a healthy sense of doubt, and above all, to bring out that sense of wonder which Feynman has so eloquently put – the ‘pleasure of finding things out, the kick in the discovery’.” – His Excellency Mr S R Nathan, President of the Republic of Singapore, bringing a special message to mentors and teachers at the Opening Ceremony.
Hearty success

Follow your heart and it will take you places. Lim Khee Hiang did and it has won him the Young Investigator Travel Award for his work on computational modelling of an artificial heart valve.

Under the supervision of Assoc Prof Tony Yeo Joon Hock from the School of Mechanical and Production Engineering, and his team comprising Assoc Prof Eugene Sim from the National University of Singapore and Prof Carlos Duran from the International Heart Institute of Montana Foundation in USA, graduate student Lim Khee Hiang analysed – using the finite element method – the stresses on the leaflets of reconstructed heart valves and valve molds of different profiles.

Some cardiac surgeons currently use a flat template mold to reconstruct an artificial heart valve to replace a diseased valve. The patient’s own tissue (autologous pericardium) is used for this reconstruction.

In his award-winning research, Khee Hiang developed a computer model for analysis of the H-mold (patent filed by Prof Duran and Assoc Prof Yeo). This mold has a three-dimensional profile that resembles the normal aortic valve. The computer model illustrates that the H-mold design results in an optimum surface area for effective valve closing with minimum stresses on the reconstructed valve. The flat mold, on the other hand, is essentially two-dimensional, and because it has less surface area, it generates higher stresses on the reconstructed valve. The larger surface of the H-mold results in a very effective valve model – the valve leaflets are able to maintain good surface contact that is necessary for effective valve closure without leakage. With the use of the H-mold, the stress level on the leaflet is also significantly reduced, by 69%.

The Young Investigator Travel Award is given out annually by the Asian Society for Cardiovascular Surgery to outstanding young researchers not older than 35 years. It carries a prize money of US$1,000.

Khee Hiang now intends to investigate the effectiveness of different valve molds with different valve closing pressures. “Since this work has only used molds that are symmetrical, future work will consider non-symmetrical models which are closer to the actual valve geometry, for better simulation of valve stresses,” he said.

Twin-barrel, Mr Fix-it of the deep blue

Diving into the deep sea to inspect and repair offshore oil and gas lines or cables could be all in a day’s work for Twin-barrel, the underwater robot.

An eight-member team led by Assoc Prof Gerald Seet, Director of the Robotics Research Centre, has been developing robotic wonder Twin-barrel to undertake dangerous work on oil rigs, ships and undersea cables.

Twin-barrel’s size and dexterous arm movements can offer much more than existing “camera-in-the-sea” robots. Being only one quarter the size of these robots, Twin-barrel is small enough for dexterous...
Engineering perfect skin

Getting that perfect skin is an important preoccupation of many people, including tissue engineers at NTU

For Drs Sandy Chian and Mary Chan from the School of Mechanical and Production Engineering, skin care is beyond skin-deep. For the past two years, they have been collaborating with Prof Lee Seng Teik and Dr Phan Toan Thang of the Burns Centre at the Singapore General Hospital to develop a process for biodegradable polymeric scaffolding that will support the growth and regeneration of skin tissue.

Tissue engineering holds much promise for tissue and organ replacement. At this point, the team has successfully developed a process to produce porous scaffolds – structures to which skin cells attach – from chitosan, a biodegradable polymer derived from the shells of crustaceans such as crabs. The use of chitosan in medical applications is not new; it has been successfully used in dietary supplements and as wound dressing material as it is widely accepted to be non-cytotoxic, ie, not toxic to cells.

The basic idea in tissue-engineered skin is to grow cells on the porous scaffold before transplanting it to the patient’s wound. Simultaneously, as the wound starts to heal and as the cells seeded on the scaffold start to multiply, the scaffold begins to dissolve away, leaving behind new skin tissue. Initial in vitro studies using fibroblast cells (connective tissue cells) have shown that chitosan membranes are not toxic to cells. Furthermore, the cells seeded on them grow well and spread over the entire scaffold structure. Studies to evaluate how well other skin cells grow on this scaffold show promising preliminary results.

A good scaffolding technique for tissue engineering is able to control its porosity; many researchers use leachable substances such as salt to achieve this. The team has developed with the University of Washington a new method of controlling scaffold porosity without the use of leachable substances. They are now seeking a process patent for the technique.

The three-phase underwater robot project began in July 1998 with funding from British Gas Asia Pacific and NTU’s University Research Fund. It is now in its second phase and is expected to produce a commercial product in three to five years’ time.

When ready for use, Twin-barrel will be a boon to the oil rig and ship-repairing industries in Singapore, saving them significant amounts of money. For example, it could help to extend the life of rigs by verifying the state of crucial joints, or weld seams to make them last longer. But, perhaps, best of all, the little mighty machine is expected to come with a very attractive price tag.

As amazing as it sounds, NTU researchers (from left) Dr Mary Chan, Dr Zhu Xiao, Andrew Ng and Assoc Prof Sandy Chian can grow you new skin interventions required in many marine applications. The 110kg robot can also dive up to 200m – while being controlled above water by an operator at the computer.

Going for the long haul: Twin-barrel’s creators watch as it prepares to take the plunge during a trial session
**Personalities**

**Dr Hong Hai, new Dean of Graduate Programmes**

From building up the reputation of large companies to expanding NTU’s MBA and other executive programmes.

![Dr Hong Hai brings over 25 years of business experience to the classroom](image1)

That’s the switch Haw Par Group President and CEO Dr Hong Hai is making after more than 25 exciting years in the business world.

In July, he was appointed Professor and Dean Designate (Graduate Programmes) at the Nanyang Business School, in which position he will oversee, develop and promote the School’s MBA, MSc, PhD and other executive programmes. He will also look into expanding industry and graduate alumni networks.

Dr Hong, 58, shared: “At this age, I felt it was timely to move out of full-time corporate executive life to non-executive board positions where I can lend my experience to company managements. At the same time, a career in a business school would also make good use of my business network and experience. NTU is a dynamic and innovative institution, and I felt it was an excellent fit for me.”

Dr Hong serves the first nine months of his three-year appointment on a part-time basis until he retires from Haw Par in April next year.

A Colombo Plan Scholar, he graduated with first class honours in electrical engineering from the University of Canterbury, New Zealand. Subsequently armed with a Masters in Public Administration from Harvard University and a PhD in Economics from Carnegie Mellon University, he spent six fruitful years in academia, first, as Assistant Professor of Finance at the Kellogg School of Management in Northwestern University and, later, as Associate Professor of Business Administration at the National University of Singapore. The former Member of Parliament currently serves on the board of a number of listed public companies and chairs the Economic Committee of the Singapore Chinese Chamber of Commerce and Industry.

**Our Toastmasters champ**

Dr Phyllis Wachob’s latest achievement is, literally, something to speak of. Representing the Nanyang Business School Staff Toastmasters International Club, the professor held her own at the International Speech Contest (Area D4, District 51) and emerged the Champion.

As if that weren’t enough, she also took the first runner-up spot in the Annual International Speech Contest, 2001 – 2002 (D Division, District 51).

Dr Wachob spoke about “The Paradox of Patriotism”, a topic she chose for its topicality and personal significance. In her speech, she limited her focus to three main incidents – the September 11 attacks, the Vietnam War and the funeral of her father, a war veteran. The common thread running through these is the paradox of patriotism and war.

Asked about the secrets of her oratorical success, the modest lady would only offer these four tips – prepare and practise, choose a topic that you can relate to and feel passionate about, make it simple, and tell stories. The last is especially important, she said, to help engage your audience.

Dr Wachob said that Toastmasters International clubs offer many opportunities to build up one’s confidence in public speaking. “The whole ethos is friendly competition. You may not win anything but you’re there to develop yourself. Nobody puts you down. It is a comfortable place to be a competitor.”

**PhD student tops IEEE student paper contest**

PhD student Gao Yang has published widely in international refereed journals and conference proceedings. So it came as no surprise when the School of Electrical and Electronic Engineering (EEE) student walked away with the first prize in the IEEE Region 10 (Asia-Pacific Region) Student Paper Contest 2002.

IEEE (Institute of Electrical and Electronics Engineers) Region 10 covers a geographical area stretching from South Korea and Japan in the northeast to New Zealand in the south and Pakistan in the west. This is the first time that an NTU postgraduate has won the first prize in the contest.

In her paper “Online Identification and Control of Nonlinear Systems Using Generalized Fuzzy Neural Networks”, Gao Yang describes the design and development of a superior and robust adaptive control system using fuzzy logic and neural networks. Her research was supervised by Assoc Prof Er Meng Joo from EEE.

Gao Yang received her BEng degree with first-class honours from NTU in 2000 and has been a PhD student at EEE ever since.

Gao makes it to number one and sets a new record for NTU

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Lifelong learning – our global endeavour

Participants of the Association of Southeast Asian Institutions of Higher Learning (ASAIHL) Seminar take stock of lifelong education and pledge to advance it through global cooperation

143 key representatives from Southeast Asia’s institutions of higher learning met up in NTU from 17 –18 June to discuss and tackle issues in professional development, postgraduate education and online learning.

At the ASAIHL Seminar on Lifelong Learning, they exchanged views on three sub-themes that reflect today’s new global times – challenges and strategies in professional development education, the role of postgraduate education in the professional development of the workforce, and the exploitation of the online media in the learning environment. Many were present to share their country’s experience in the implementation of lifelong education and e-learning, and were eager to collaborate in the continuing education of our global citizens.

Mr Hawazi Daipi, Parliamentary Secretary of the Ministry of Education, graced the Opening Ceremony on Monday, 17 June. A total of two keynote addresses, six country reports and 29 individual papers were presented. NIE Director Prof Leo Tan set the tone for the seminar with his keynote address titled “Tertiary Institutions – Their Place in Lifelong Learning”. The second keynote address, delivered by Prof Datin Dr Rohaty Mohd Majub from Malaysia, centred on “Globalisation and ICT: Challenges Facing the Universities”.

Founded in 1956 as a non-governmental organisation, ASAIHL has a membership today of close to 200 universities and colleges from Southeast Asia, Australasia and beyond, including Canada and USA. Through activities such as conferences, fellowships and academic exchange programmes, the association helps its member institutions to strengthen themselves and achieve international distinction in teaching, research and public service.

Father of the mouse clicks with NBS crowd

Dr Engelbart, one of the most esteemed personalities in the history of modern computing, drops in at the Nanyang Business School

Dr Douglas Engelbart, 75, a pioneer in interactive computing, visited the Nanyang Business School (NBS) on 25 April. The visionary scientist, who was in Singapore to present a keynote speech at the World Library Summit, conducted a workshop entitled “Improving Our Ability To Improve” as part of the Information Management Research Centre’s workshop series.

Over the past 51 years, Dr Engelbart’s research has been focused on a single goal: “to (as much as possible) boost mankind’s collective capability for coping with complex, urgent problems.” This he achieved brilliantly by inventing the mouse, multiple windows, hypertext (hypermedia) and many other elements of the modern human computer interface we use today.

Meeting Dr Engelbart was an exceptional experience for those present at the workshop, mostly NBS staff, students, alumni and industry contacts. In his talk, he examined the forces that have shaped the enormous growth in computing capability over the last 50 years. He argued that our criteria for investment in innovation have been short-sighted and focused on the wrong things. The real need of the day? Investment in an improvement infrastructure that will bring about sustained, radical innovation capable of advancing computing and augmenting human capability (our collective IQ) even further.

The man with over 20 patents to his name is the founder and director of the Bootstrap Institute in California (www.bootstrap.org), which focuses on creating high-performance organisations through collaboration. Among the prestigious awards he has received are the National Medal of Technology, ACM’s Turing Award, and the British Computer Society’s Lovelace Award. This year, the state of Oregon declared 24 January Douglas Carl Engelbart Day. The only other person to receive such an honour in the history of Oregon is Nobel Laureate Linus Pauling.
Two of the best

Two professors from the Nanyang Business School (NBS) have delivered more than just praise-worthy research – they have produced Best Papers.

Prof Ang Soon, Head of the Division of Strategy, Management and Organisation, received best paper honours at the Association for Computing Machinery Special Interest Group on Computer Personnel Research Conference in May. Her award-winning paper “Internal Labour Market Strategies and Turnover of Information Technology Professionals” was co-written with Prof Sandra Slaughter of Carnegie Mellon University.

Also a picture of success is Dr Josephine Lang, who clinched the Journal of Knowledge Management’s Best Paper Award. Her paper “Managerial Concerns in Knowledge Management”, which outlines a new model for knowledge outcomes in organisations, was judged to have made the most valuable contribution to the field of knowledge management in 2001 (Volume 5). Not surprisingly, this paper was among Emerald’s Top 10 Most Accessed Articles for December 2001.

Consulting for Canada

The Government of Canada, currently negotiating an agreement on labour cooperation with Singapore in the context of recent bilateral free trade negotiations, has roped in Assoc Prof Michael Heng, a Certified Management Consultant (CMC), to undertake a study on labour legislation in Singapore. The study, a key resource for the bilateral negotiations, will cast some light on the labour situation here and the extent to which core labour principles (as expressed in the ILO Declaration on Fundamental Principles and Rights at Work) are reflected in current legislation and implemented in practice. Assoc Prof Heng has consulted widely with local and foreign multinational corporations in the manufacturing and service industries. As a CMC, he has met world-class standards of consulting competence, ethics and independence, and is internationally recognised – across 35 countries – as a top management consultant. There are currently only 56 CMCs in Singapore.

Promotion to full Professorship

Prof Koh Soo Ngee, EEE
Prof Soh Yeng Chai, EEE
Prof Yoon Soon Fatt, EEE
Prof Anand Asundi, MPE
Prof Gillian Yeo Hian Heng, NBS

Congratulations!

Mauritius government thanks Prof Lim Chong Yah

The “Father of Tripartism”, Prof Lim Chong Yah, has concluded a successful consultation visit to Mauritius. A 48-page Final Report on the Recommendations of Wage Reforms was submitted to the Prime Minister and Deputy Prime Minister of Mauritius on 15 May. The report evaluates the present wage system and recommends wage reforms that aim to remove wage and employment rigidity as well as reduce wage-linked inflationary pressures. For growth and employment with price stability and equity, a wage system that encourages hard work, skill-acquisition, innovation, enterprise and investment is advocated. Prof Lim, a distinguished Professor of Economics at the Nanyang Business School, had been appointed by the Mauritius government to be its Consultant on the Mauritian wage determination system and wage reforms. He was assisted in this project by colleague Prof David Reisman and his doctoral student, Sng Hui Ying.
Welcome

The University welcomes the following new staff members:

Nanyang Business School (NBS)
Mr Yu Kang Yang – Senior Tutor
Prof James Ross Booth – Visiting Professor
Miss Li Weng – Program Manager, Executive MBA Programme

School of Computer Engineering (SCE)
Dr Liu Xiao Fan, Sophie – Assistant Professor
Astr Prof Timo Roel Bretschneider – Assistant Professor
Mdm Li Fang – Lecturer
Dr Sukumar Nandi – Senior Fellow
Mr Qiu Ling – Research Associate
Mr Liu Kok Sen – Project Officer
Miss Liew Li Hong – Project Officer
Mr Ang Hak Seng – Adjunct Research Associate
Mr Tan Hung Hooi – Adjunct Research Associate

School of Materials Engineering (SME)
Dr Hao Jiyuan – Research Fellow
Dr Wu Sun Woong – Research Fellow
Mr Zhao Xiaole - Research Associate

School of Civil & Environmental Engineering (CEE)
Dr Lim Ewe Chye – Associate Professorial Fellow
Mr Cai Lu – Project Officer
Mr Ho Chun Teck – Research Fellow
Dr Qi Chenjie – Research Fellow
Dr Sarangan Vijaya Bhaskara Rao – Research Fellow
Dr Wang Zhifeng – Research Fellow
Dr Zhang Xunjun – Research Fellow
Mdm Luo Fang – Research Associate
Mr Yu Zhangxiong – Research Associate
Mr Zeng Aiping – Research Associate
Mr Zhang Guohai – Research Associate
Mr Banusi Endah Priyanto – Project Officer
Mdm Chew Kerlit – Project Officer
Mr Duan Bing – Project Officer
Mr Hery Susanto Djie – Project Officer
Mr Khoo Wc Sng – Project Officer
Mr Lee Kiong Aik – Project Officer
Miss Teh Geok Har – Project Officer
Mr Zhang Qingsheng – Project Officer

School of Electrical & Electronic Engineering (EEE)
Assoc Prof Henry Lew – Associate Professor
Astr Prof Chong Han Joo, Peter – Assistant Professor
Prof Jacob Savir – Visiting Professor
Dr Li Chao – Research Fellow
Dr Qi Chenjie – Research Fellow
Dr Sarangan Vijaya Bhaskara Rao – Research Fellow
Dr Wang Zhifeng – Research Fellow
Dr Zhang Xunjun – Research Fellow
Mdm Luo Fang – Research Associate
Mr Yu Zhangxing – Research Associate
Mr Zeng Aiping – Research Associate
Mr Zhang Guohai – Research Associate
Mr Banusi Endah Priyanto – Project Officer
Mdm Chew Kerlit – Project Officer
Mr Duan Bing – Project Officer
Mr Hery Susanto Djie – Project Officer
Mr Khoo Wc Sng – Project Officer
Mr Lee Kiong Aik – Project Officer
Miss Teh Geok Har – Project Officer
Mr Zhang Qingsheng – Project Officer

School of Mechanical & Production Engineering (MPE)
Astr Prof Lim Cheng Geok – Assistant Professor
Dr Kwon Kye-Si – Research Fellow
Dr Liu Ruiyan – Research Fellow
Dr Xie Dong Zhu – Research Fellow
Dr Zhang Xuan – Research Fellow
Mr Chen Xulang – Project Officer
Mr Zhai Ming – Research Associate
Mr Soh Ying Chear – Project Officer
Dr Theresia Komang Kalebitso – Project Officer
Mr Chow Shiahau – Senior Officer [Lab] (Grade 5)

School of Communication & Information (SCI)
Mr Wong Teck Zhang – Project Administrator

School of Biological Sciences (SBS)
Prof Law Sai-Ki, Alex – Professor
Assoc Prof Chen Wei Xin, William – Associate Professor
Assoc Prof Peter Droge – Assistant Professor
Astr Prof Chen Xin Jie – Assistant Professor
Astr Prof Lim Siew Peng – Assistant Professor
Astr Prof Lim Chun Lian, Valerie – Assistant Professor
Astr Prof Rupert Charles Wilmouth – Assistant Professor
Astr Prof Yu Chun-Wen, Kenneth – Assistant Professor

College of Engineering
Prof (Adj) Boon Swan Foo – Adjunct Professor

Office of Academic Services
Mr Lee Hon Yee – Senior Officer (Grade 5A)

Office of Human Resources
Miss Ang Yee Chay – Senior Officer (Grade 4)
Mr Foo Chai Min – Senior Officer (Grade 5A)

Student Affairs Office
Mr Choo Choon Huat – Senior Officer (Grade 5)
Miss Ang Poh Khan, Jenny – Hostel Management Officer (Grade IV)
Miss Loh Kwa Fum – Hostel Management Officer (Grade IV)

Centre for IT Services
Mr Sim Meng Kiang, Leonard – Senior Officer [IT] (Grade 5)

Singapore-MIT Alliance Programme
Dr Sudhakar Venkataramanan – Research Fellow
Mr Thian Eng San – Research Associate
Mr Wang Shengyin – Research Associate
Mr Zhang Wenyu – Research Associate

Institute of Defence & Strategic Studies
Mr Mark Hong Tai Soon – Visiting Senior Fellow
Mr Keith Fitzgerald – Adjunct Fellow

NIE

Policy & Management Studies
Astr Prof Koh Wai Pin, Jonathan – Assistant Professor

English Language & Literature
Astr Prof Maha Srepathy – Assistant Professor

Humanities & Social Studies Education
Ms Sim Boon Yee, Jasmine – Lecturer (transferred from MOE)
Miss Koh Noi Keng – Teaching Fellow

Natural Sciences
Dr Ostrikov Kostyaevsky – Research Fellow (transferred from NTU)
Mdm Meng Shu – Project Officer

Computer Services Centre
Mr Teo Say Chong – Senior Officer [IT]
Mr Hee Choe Meng – Senior Officer [IT]
Miss Chua Hein Hean – Senior Officer [IT]

E-learning Competence Centre
Miss Tan Li Shun, Sharon – Senior Officer [ECC]
Miss Chua Chee Hian – Senior Officer [ECC]
Mr Koh Khee Teck – Senior Officer [ECC]

Appointments

New Appointments
Prof Harcharan Singh – Director, Office of Dean of Graduate Studies
Prof Choo Seok Cheew – Associate Dean (Graduate Studies), College of Engineering
Assoc Prof Seah Hock Soon – Dean, SCE
Prof Angela Goh Ekk Soong – Vice-Dean, SCE
Assoc Prof Yeo Song Huat – Sub-Dean, MPE
Assoc Prof Leong Kai Choong – Vice-Dean, MPE
Assoc Prof Hao Xiaoqiang – Vice-Dean, SCI
Prof Alex Law – Vice-Dean, SBS
Assoc Prof Chiew Sing Pong – Sub-Dean, CEE
Assoc Prof Koho Li Feng – Head, Division of Mechatronics and Design, MPE
Assoc Prof Tor Shu Beng – Head, Division of Manufacturing Engineering, MPE
Assoc Prof Francis Lee Bu Sung – Head, Division of Computer Communications, SCE
Prof Lars Nordenskiold – Head, Division of Structural and Computational Biology, SBS; Acting Head, Division of Chemical Biology and BioTechnology, SBS; Acting Head, Division of Genomics and Genetics, SBS; Acting Head, Division of Molecular and Cell Biology, SBS
Assoc Prof Cheang Hong Ning, Philip (SME) – Director, Advanced Materials Research Centre (AMRC)
Assoc Prof Chai Chin Boay (MPE) – Deputy Director, NTU-MNDEF Protective Technology Research Centre (PTRC)
Assoc Prof Shum Ping (EEE) – Director, Network Technology Research Centre (NTRC)
Assoc Prof Anil Kumar Gupta (SCE) – Deputy Director, NTRC

Re-appointments
Prof Cheong Hee Kiat – Dean, CEE
Assoc Prof Harianto Rahardjo – Vice-Dean, CEE
Assoc Prof Yap Woon Kwoong – Vice-Dean, CEE
Prof Er Meng Hwa – Dean, EEE
Assoc Prof Kam Chan Hin – Vice-Dean, EEE
Assoc Prof Teoh Eam Kioh – Vice-Dean, EEE
Assoc Prof Yoon Soon Fatt – Vice-Dean, EEE
Assoc Prof Tay Beng Kiang – Sub-Dean, EEE
Assoc Prof Yeo Kiat Seng – Sub-Dean, EEE
Prof Yue Chee Yoon – Dean, MPE
Assoc Prof Lye Sun Woh – Vice-Dean, MPE
Assoc Prof Seah Leong Keey – Vice-Dean, MPE
Assoc Prof Hoon Kay Hiang – Sub-Dean, MPE
Prof Ngan King Ngi – Vice-Dean, SCE
Asst Prof Yow Kin Choong – Sub-Dean, SCE
Prof Fong Hock Sun – Dean, SCE
Assoc Prof Freddy Boey – Vice-Dean, SME
Asst Prof Hng Huey Hoon – Sub-Dean, SME
Prof Eddie Kuo – Dean, SCI
Assoc Prof Ang Peng Hwa – Vice-Dean, SCI
Asst Prof Gan Su-lin – Sub-Dean, SCI
Prof Lun Kwok Chan – Vice-Dean, SBS
Assoc Prof Gerald Seet Gim Lee (MPE) – Director, Robotics Research Centre (RRC)
Assoc Prof Wang Dan Wei (EEE) – Deputy Director, RRC
Assoc Prof Andrzej Sluzek (SCE) – Deputy Director, SCE
Assoc Prof Wang Kok Cheong (SCE) – Director, Centre for Graphics & Imaging Technology (CGIT)
Assoc Prof Eddie Ng Yin Kwee (MPE) – Deputy Director, CGIT
Assoc Prof Wang Han (EEE) – Deputy Director, CGIT
Prof Robert Gay Kheng Leng (EEE) – Director, Application Service Providers (ASP) Centre
Assoc Prof Khor Khiam Aik, Michael (MPE) – Deputy Director, Advanced Materials Research Centre (AMRC)
Prof Pan Tso Chien (CEE) – Director, NTU-MNDEF Protective Technology Research Centre (PTRC)
Assoc Prof Lalit Kumar Goel (EEE) – Deputy Director, NTU-MNDEF PTRC
Prof Chew Cheng Hui – Director, Centre for Chinese Language & Culture (CCLC)
A dean’s story

Prof Harcharan Singh steps down as Dean of the School of Computer Engineering after 14 exciting years at its helm

Prof Singh led SAS, then SCE, with an iron discipline and a big heart. His pioneering spirit, integrity, and passion for education will always be remembered.

having him as their lecturer vouch for his passion and excellence as a teacher. Others from outside the School have told SCE staff what a kind and upright man he is. Indeed, he is a man with a huge heart and loads of integrity, someone who cares and gives of himself without wanting to call attention to it. This is Prof Singh – dean, teacher, mentor, and a very fine gentleman.

Visitors

During the period April to June 2002, the University received the following distinguished visitors:

- 2 Apr Prof Qin Shaode, Chairman and Party Secretary, Fudan University, PRC
- 17 May Prof Dr Nguyen Tan Phat, President, Vietnam National University, Ho Chi Minh City, and Vice-Minister, Ministry of Education and Training, Vietnam
- 25 May Prof (Dr) Suresh Raj Sharma, Vice-Chancellor, Kathmandu University, Nepal
- 29 May HE Mr Yuan Guiren, Vice Minister of Education, PRC
- 1 Jun Mr Chiang Chie Foo, Permanent Secretary, Ministry of Education, Singapore
- 6 Jun Prof P B Sharma, Vice-Chancellor, Rajiv Gandhi Technological University, India
- 17 Jun Prof S Mustafa, Vice-Chancellor, Federal University of Technology, Nigeria

During this period, the University also received visiting delegations from Rajabhat Institute Udonthani, Dhurakijpundit University, Burapha University, Naresuan University, Thammasat University, Silpakorn University, and the Ministry of University Affairs, Thailand; Xian Jiaotong University, Huazhong University of Science and Technology, People’s Government of Guangdong Province, and the Shanghai Education Commission, PRC; Universitas Trisakti, Indonesia; Universiti Utara Malaysia; and the Association of Southeast Asian Institutions of Higher Learning (ASAIHL).