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# UNIVERSITY OF TWENTE.

# KING OPENS 'THE GALLERY' INNOVATION CENTRE MR BLUETOOTH TOP BUSINESSMAN GERARD SANDERINK: Bringing talent to Twente



# THE MEASURABLE **18**













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# FOREWORD

# **OUR OWN INNOVATIVE STRENGTH**

On a recent visit to Singapore, I had the opportunity to visit the vibrant Campus for Research Excellence And Technological Enterprise (CREATE). The speed with which innovation is pursued there is astonishing. Our Singaporean counterparts were extremely interested in the University of Twente campus, with its international reputation as a seedbed of knowledge-intensive enterprise. This visit resulted in valuable new contacts and partners, but it also gave me serious misgivings about current Dutch innovation policy. Singapore can set up a full-scale research programme, with government funding, in practically no time. We can certainly learn from their example. I was particularly impressed by their spirit of enterprise. Of course, the two countries' funding systems are not directly comparable. Even so, if a university and region devote their full energy to a project, the financial aspects will soon fall into place. As an 'enterprising' university, we

simply cannot afford to wait until government policy catches up with our ambitions. Neither should we focus solely on becoming the next Silicon Valley or even emulating CREATE. We have quite enough innovative ability of our own. The technology we develop in our laboratories is decades ahead of the political decision-making process. One area in which progress can be made is the application of that technology in new products which are manufactured here in our own region. This is why I welcome the initiative of Twente alumnus and top businessman Gerard Sanderink, as reported elsewhere in this magazine. Gerard intends to invest in young talent and create new employment. His plans will take the entire region one decisive step forwards, with new jobs at all levels from high-tech R&D to production and maintenance. It is through this sort of initiative that our university will become the true driving force of a new manufacturing industry in Twente. •

"THE TECHNOLOGY WE DEVELOP IN OUR LABORATORIES IS DECADES AHEAD OF THE POLITICAL DECISION-MAKING PROCESS"



(B. 1960), PRESIDENT OF THE EXECUTIVE BOARD OF THE UNIVERSITY OF TWENTE SINCE OCTOBER 2013.



# TECHNOLOGY IN HEALTHCARE: THE KEY TO BETTER QUALITY AND AFFORDABILITY

# TAP AND MOP

Healthcare expenditure will continue to rise, driven by population ageing and new treatment options. Hospital care and residential care for the elderly will lay particularly heavy claims on the government's healthcare budget. Many are pinning their hopes on technology as means of making health services more efficient, thus keeping costs in check. But is technology really the solution, or is it a cause of the burgeoning costs? BY Kees de Rijk PHOTOS Kees Bennema

There is a Dutch expression which translates as 'mopping the floor with the tap still running': a never-ending task. If it can be applied to efforts to keep the rapidly rising costs of healthcare within bounds (see insert on p. 5), technology is both the mop and the tap, contends Prof. Maarten J. IJzerman, professor of Health Technology & Services Research and acting Scientific Director of the Institute for Biomedical Technology and Technical Medicine (MIRA)."Healthcare is becoming more expensive because technological innovations enable us to do more. We expect more – and are willing to pay - which results in a greater number of diagnostic tests and interventions. In addition, our healthcare funding system is based on output: the more patients you treat, the more money you earn."

#### **Collective pressure**

Technology and the market are outpacing healthcare practice. "The introduction of a new treatment option is preceded by many years of clinical research," IJzerman continues. "But once it is being used in the field, it is generally there to stay even if there is little scientific evidence to support its value. There is little substitution; treatment options are not replaced but are supplemented by new ones. Patients demand quality, choice and service, for which many are willing to pay. Our system guarantees that even those with limited disposable income receive excellent basic care. The collective pressure on the healthcare budget is likely to have an adverse impact on the economy, believes IJzerman. "At present, the Netherlands spends fifteen per cent of its GDP on healthcare. In the USA, the figure has already reached

twenty per cent. I think this is very near the upper limit, which means that the distance between affordable basic care and expensive private care will become ever greater."

#### **Cost awareness**

Technological innovations are applied in pursuit of health gains, IJzerman realizes, whereby lower costs are merely a secondary effect. "Twenty years ago, having a total hip replacement meant spending a week in hospital. Today, you are back home in two days. A modern implant is less likely to be rejected, which is obviously a health gain. But in the longer term it also represents a significant cost reduction." IJzerman believes that the greatest potential for technology intended to enhance efficiency will be seen in the field of 'domotics' (see insert on p. 7), and in improving the transfer of information between systems and care professionals. "I expect health



insurers to devote more attention to cost awareness. Hospitals will increasingly be judged by their financial performance."

#### Hand-in-hand

In the longer term, there are also significant gains to be made in terms of prevention, predicts IJzerman. "There will be technology for early detection, e-health applications and 'telemedicine' to support patients with a chronic condition. On a larger scale, I foresee technology for planning mobile care services in sparsely populated countries, and point-of-care technology for the diagnosis of malaria and HIV, all of which will improve the quality of care in the poorer regions. The opportunities for health gains and cost reductions go hand in hand."

### **Spinning plates**

Prof. Miriam Vollenbroek-Hutten is professor of Technology Supported

Cognitive Training and cluster manager at Roessingh Research and Development (RRD) in Enschede. Her specialist area is 'telemedicine': the use of information technology to support the rehabilitation of chronic patients in their own homes. She compares the Dutch healthcare system to keeping spinning plates in the air: everything must be perfectly coordinated. "In many cases, new technology does not take sufficient account of care professionals' working practices. At the same time, the field has too few incentives to pursue innovation: change costs time, effort and money." Prof. Vollenbroek's research reveals that patients are often eager to embrace new technology. "They see the advantages of, say, having an online consultation with the specialist rather than having to travel to the hospital quite so often. For the

professionals, however, talking to the patient via a video link is still outside their 'comfort zone'."

#### Valuable and necessary

Through her research, Prof. Vollenbroek has been able to demonstrate the value of physiotherapy in the home with online support. "It is an essential development, since before long it will be impossible to treat the growing number of chronic patients using traditional methods. We are developing a portfolio of technologies which pass greater responsibility to patients themselves. Eventually, the most effective will be combined to form a 'smart package' which can be integrated with the healthcare providers' patient management systems. Individual, personalized treatment plans can then be generated automatically." As the first step towards this patient self-

# DOSSIER HEALTHCARE COSTS



Prof. Miriam Vollenbroek-Hutten, professor of Technology Supported Cognitive Training, and manager of the Telemedicine cluster at Roessingh Research and Development (RRD) in Enschede.

"A 'buddy' who provides unconditional support when things are difficult but who also spurs you on to try even harder, matching each new challenge to what is actually possible at that moment."

management system, Vollenbroek is currently coordinating a European research project to identify the resources required if people are to take greater responsibility for their own health.

### **Buddy**

Vollenbroek intends to encourage health-conscious behaviour and patient compliance by giving her self-management system certain human traits. "It will be a sort of 'buddy' who provides unconditional support when things are difficult but who also spurs you on to try even harder, matching each new challenge to what is possible at that moment. Intelligence and intuition will be built in to a smartphone, domestic robot or even a refrigerator, offering help when it is needed but leaving well alone when it is not. When friends and family call, they are visiting a person, not a patient. They are visitors, not carers. That is the dream I am pursuing."

## **Increasing demand**

Prof. Richard Boucherie is professor of Stochastic Operations Research and is affiliated with the Center for Healthcare Operations Improvement and Research (CHOIR). He has no doubt that his discipline, healthcare logistics, can do much to increase efficiency and effectiveness. "By making better use of scarce resources such as hospital beds, operating theatres and staff, we can keep up with the increasing demand for health services."

Through logistical interventions, Boucherie expects to be able to mitigate the effects of the staff shortage expected over the next twenty years, while maintaining the quality of care at its current high level. "The Netherlands is a rich country. We can afford expensive new technology. However, if we don't have the people to provide good care, we have a problem."

## **Queuing theory**

In the last ten years, the CHOIR research centre (see insert), which was co-founded by Boucherie, has conducted some 250 field studies in hospitals. One notable finding is that many care providers attempt to solve logistical problems by increasing their staffing levels. "In our experience, it is usually possible to reorganize the rosters and workflows so that more can be done by the same number of people."

The healthcare sector is only just beginning to realize the gains to be made by optimizing logistics and work processes. In industry, this has been a key focus for at least a century. "Our algorithms are based on the 'queuing theory' developed by Adner Erlang, the Danish mathematician who undertook a quantitative analysis of the Copenhagen telephone exchange in the early twentieth century. His ideas have since found applications in telecommunications, traffic



Prof. Maarten J. IJzerman, professor of Health Technology & Services Research, acting Scientific Director of the Institute for Biomedical Technology and Technical Medicine (MIRA).



Prof. Richard Boucherie, professor of Stochastic Operations Research and affiliated with the Center for Healthcare Operations Improvement and Research (CHOIR).



Dr Timo Hartmann, Senior Lecturer in Construction Engineering and Management, and affiliated with the Center for Visualization and Simulation in Construction (Department of Construction Management and Engineering; BI).

engineering, computing, and the design of factories, shops and offices."

#### **Decisive action**

The results achieved using CHOIR's algorithms are impressive. At the AMC hospital in Amsterdam, the waiting time for a CT scan has been reduced from three weeks to just two days. At the nearby Antoni van Leeuwenhoek oncological institute, a sixth operating theatre has been opened without the need for any additional nursing staff. Another hospital has reorganized its operations schedule resulting in a twenty per cent reduction in the number of in-patient beds required. Boucherie knows that such spectacular results can only be achieved if decisive action is taken. This can prove difficult in practice. "Implementation must be thorough if the full potential for improvement is to be achieved. This is why we support the creation of a spin-off company which will assist in implementing a study's findings even before the study itself has been completed."

### Inefficient

Dr Timo Hartmann sees opportunities for major cost reductions based on the 'smart' design of hospitals and diagnostic centres. He is a senior lecturer in Construction Engineering and Management, and is affiliated with the Center for Visualization and Simulation in Construction. "At present, the design and development of a complex building can take ten, perhaps twenty years. A major renovation is then needed every four years due to the lack of flexibility in the design. This is very inefficient." Hartmann is familiar with the figures from the United States. "When I apply the same percentages to the Dutch situation, I see potential savings of four or five billion euros a year."

#### A single process

"By the time that a hospital is actually built and operational, the market requirements and the available technology have radically changed," Hartmann explains. He has therefore developed an interactive method based on visualization techniques, whereby all stakeholders - from medical personnel to system engineers - are involved in the design process. "The various stakeholders can see how their processes interact and influence each other, and what impact changes to the design and location choices will have. Taking all interests and rational decisions into account within a single process shortens the project lead time and leads to a better end result."

#### **Choice of location**

Hartmann's method looks beyond the structural design of the building to consider its optimum location, based on demographic trends and factors such as the referrals behaviour of GPs. "I believe that our simulation techniques will optimize the availability of diagnostic services,

#### DOMOTICS: TECHNOLOGY IN THE HOME

Between 2010 and 2013, the High Tech Health Farm studied the use of 'domotics': healthcare technologies in the home. The project was co-funded by the Province of Overijssel and led by the University of Twente's MIRA institute. Various technologies and implementation models were developed to monitor and manage conditions such as kidney failure, epilepsy, chronic pain, hypertension and rheumatoid arthritis.

for example. The right combination of location and services will enhance the preventative value of the extramural facilities, and in the long term will reduce costs by many billions of euros."

### **Cause and solution**

Can technology be both the cause of the increase in demand for health services and the solution? Based on the foregoing, technological innovation does have a certain paradoxical effect. If everything that is developed is actually implemented, in addition to existing services rather than in their place, every innovation will increase healthcare demand, consumption and costs. At the same time, technology in the form of logistical interventions, the smart design of buildings, domotics and telemedicine has a clear role to play in the prevention of health problems. It will bring clear gains in terms of the manageability, affordability and quality of our health system, as well as improving the quality of life.

Healthcare costs are also the subject of the Innovation Lecture (see pages 18-19).

# IN BRIEF



# LIFE CYCLE OF POLITICAL PARTIES



Between 1960 and 2010, political parties in Western European saw their membership dwindle by an average of 1.9% a year. This is one of the findings of a PhD research project by Ann-Kristin Kölln. Over the course of fifty years, overall membership has fallen by over forty per cent. The exodus has been greatest among those parties founded prior to 1945. It seems that the trend is part of the natural life cycle of parties; the more firmly a party is established within the political landscape, the more members it will lose. As a result, a party is likely to employ a greater number of paid staff, become more dependent on government funding, and focus primarily on election years rather than the periods in between.





# **HELMET BABIES**

One in every five babies born in the Netherlands is diagnosed as having some skull deformity, a cosmetic problem which can be treated with a 'redression helmet'. From the age of five or six months, the baby must wear the helmet 23 hours a day until he or she is one year old. Each year, some four thousand babies undergo this treatment. However, a doctoral thesis by Renske van Wijk has shown that, in most cases. wearing the helmet is no more effective than letting nature take its course. Moreover, the treatment is expensive and often causes adverse side effects.

The University of Twente has over **100** sports clubs, cultural societies, social groups and international associations, with a total of over **400** committee members.

# **SPIN ICE**

University of Twente researchers have become the first in the world to create thin films of a 'spin ice' material. Physicists are extremely interested in spin ice materials because they display a geometrically frustrated magnetic system which is associated with the phenomenon of the 'magnetic monopole'. The elementary constituents of spin ice are magnetic dipoles, but it seems that the poles can be separated to move independently through the material: an example of the phenomenon known as 'fractionalization'. Any practical application of a spin ice demands a thin sheet or layer of the material which can be incorporated into devices such as a chip. This is what the Twente researchers have now achieved.

# IN BRIEF

Each of the **150** trees on Laan van Innovatie (Innovation Avenue) is to be dedicated to a local company in recognition of the sustainable innovation which has its roots in Twente.



### KING OPENS NEW INNOVATION CENTRE

On 2 April, HM King Willem-Alexander visited the University of Twente campus to perform the official opening of The Gallery. The building, with its 300-metre facade, provides business accommodation and high-quality facilities for innovative companies. It is already a local landmark. Prior to His Majesty's arrival, a large crowd gathered to welcome another special guest, the university's new campus robot FROG (Fun Robotics Outdoor Guide). FROG has its own personality, explores its surroundings independently, and can take visitors on a guided tour of the local cultural highlights. The robot will take up its on-campus 'duties' later this year.

The University of Twente offers **20** Bachelor's programmes and no fewer than **31** Master's programmes.

# **JOURNEY PLANNER**

The Dutch national railways operator NS has begun trials of a journey planning app developed by Twente researcher Kien Tjin-Kam-Jet and the spin-off company Q-Able. Users are required to complete only one search field. Having entered, say, "Enschede to Utrecht, tomorrow at 11am", the user is shown a list of the available train services. It is also possible to plan a door-to-door journey between two addresses.



# **SUICIDAL TENDENCIES**

The semi-conductor industry has high expectations of the new material silicene, which shares many of the properties of graphene, hailed as the new 'wonder material'. Researchers from the MESA+ Institute recently became the first to film the formation of silicene in real time. However, they have bad news: it would seem that silicene has suicidal tendencies. As soon as 97% of an area is coated with the material, the silicene converts itself into basic silicon. It is therefore impossible to create a fully coated component, and equally impossible to stack several layers of silicene one on top of the other.

# ONLINE TOUCH STORIES HIGH TECH, HUMAN TOUCH





# CYBERBULLYING YOUNGSTERS ARE THE EXPERTS

As the internet has penetrated our lives, there has been an unwelcome parallel development in the form of 'cyberbullying'. University of Twente researcher Niels Baas is currently working on a PhD thesis which examines how cyberbullying affects young internet users. "I wanted to do something which would help young people," he explains. BY Joost Bruysters PHOTOS Rikkert Harink

Abusive and hurtful messages on a WhatsApp group, insults and 'trolling' on Facebook, intimate photos posted on the internet by a classmate. These are just some of the manifestations of cyberbullying which Niels Baas is researching. What makes cyberbullying so difficult to tackle is its anonymous nature and the ease with which other people can be drawn in, either as passive onlookers or active participants.

It is a difficult topic for parents and teachers, Baas contends, because they are often unfamiliar with the digital world of today's youngsters. "It is as if parents have decided that the internet is developing so rapidly that they want no part of it, and do everything possible to keep their children away from it as well. That can only be counterproductive. If we ignore the internet, we are ignoring our children. They will be online no matter what we say. But when they encounter something unpleasant, they will be unlikely to discuss it or even mention it. There is only one way forwards, and that is to embrace the digital world."

#### **Media education**

Baas sees media education as the most important weapon in the battle against cyberbullying. It is important for parents to concede that they are not the experts, the role that they tend to assume in most other areas of family life. "Admit that you do not know everything. Children are the real experts in the online world, but there are many things that they do not completely understand. Media education is a process of discovery which should be undertaken together. If your child asks a question to which you do not know the answer, sit down at the computer together and look it up."

In fact, parents do not need extensive or in-depth computer knowledge to be of help. "It's not about the digital world itself, it's about people's online behaviour towards each other. That is, or should be, governed by the same rules that apply in the real world." Baas has a number of important tips for parents. "You must always be positive about the online world, and any rules regarding internet use should be set in consultation with your child. It is also very important "There is only one thing you can do and that is to embrace the online world."







Als Bieber 'welterusten' tweet, reageren er 29.61' meisjes



to maintain an ongoing dialogue. Only then will the threshold be low enough for your children to come to you if they experience something unpleasant. You are allowed to exert control over your child's behaviour, but do so openly."

#### One in five

Exactly how widespread cyberbullying has become is difficult to ascertain. The statistics, often based on 'guesstimates', vary enormously. Baas believes that approximately one in five children has experienced some form of cyberbullying, but insists that we should not read too much into this. "At the end of the day, cyberbullying is no different from bullving in the real world. The motives are the same, the effect is the same, it's just

in a different form. The children who experience cyberbullying are those who tend to be bullied in real life, and vice versa. The cyberbully reaches a wider 'audience' and can remain anonymous, but most cases occur within a small group of classmates and acquaintances." The main difference between 'traditional' bullying and its online equivalent is, Baas suggests, that cyberbullying is much easier. "Not only is it easier for the bully to perpetrate, it is also much easier for others to ignore."

#### Shame

Because Baas was himself the victim of bullying as a child, he recognizes the mechanisms at work. "The bully is just trying to put



### CONSULTANCY

Alongside his work, Baas also has his own consultancy through which he runs parents' evenings and regular traivolunteers, the police and government departments. "Research is very interesting, but I'm more of a hands-on type," field, and this is yet another way in which I can share my knowledge.

someone down while enhancing his own status. Being bullied creates a feeling of shame. It is not easy to talk about, and you can't just laugh it off. The bully always picks on the weakest, the easiest victim."

# "Cyberbullying is no different to any other type of bullying"

Baas, who also teaches at the university alongside his research work, chose the subject of his thesis because he wanted to do something to help young people. "Not very much was known about cyberbullying, so I thought it would make a good topic for serious research. Hopefully, I can ensure that even fewer people know anything about it in future."

# THE DRIVING FORCE OF THE UNLYERSITY

On 21 May, the first copy of a new book about the University Fund was presented during the Innovation Lecture. Entitled Aanjager ('Driving Force'), its 64 pages offer a detailed examination of the Fund's role and history, together with first-hand accounts of what the Fund's support has meant to its recipients.

THE

UNIVERSITY



In 1948, various private sector companies urged the government of the day to create a new technology institute in Enschede. In effect, they were the founders of today's University of Twente and its University Fund. Their support continues to be of immense importance even today, as the Fund underpins the academic climate of our

#### Campus. By Marco Krijnsen PHOTOS UT-Beeldbank

In the immediate post-war years, demand for qualified engineers was so great that it was decided to establish a second technology institute in the Netherlands (the first being Delft). Scores of companies and public sector authorities campaigned to bring the new institute to our region and in 1948 they formed the 'Foundation for the Promotion of Technical Higher Education in the Northern and Eastern Provinces'. Their efforts were unsuccessful at first, as the government opted for Eindhoven. In 1961, however, the Ministry of Education announced the establishment of a third technology institute, to be located in Enschede. This was to become today's University of Twente.

The choice of location was largely due to the lobbying of the region's private sector. A total of 47 large companies (known as 'founders') pledged at least ten thousand guilders each towards the cost of building and equipping the institute. Smaller companies could become 'patrons' for a donation of five hundred guilders. The trust fund set up to administer the various donations had a starting capital of 1.75 million guilders. The private sector has played a prominent role ever since. Now known as the University of Twente Fund (or simply 'the University Fund'), its Board of Trustees has traditionally been chaired by a (former) director of large companies such as Royal Ten Cate, Akzo and VolkerWessels.

### **Staff housing**

The University Fund has always provided financial support in the broadest sense of the term. In 1962, its first task was to build suitable accommodation for the staff of the new institute. There was little alternative, since the Netherlands was in the grip of a severe housing shortage at the time. Without somewhere for the staff to live, the institute faced a very uncertain future. A special housing fund was set up with one million guilders at its disposal: a very significant amount at the time. Houses were built and sold to staff members, who were also able to call upon the fund for a short-term loan to cover their relocation expenses. The housing fund was responsible for the construction of no fewer than 139 properties in and around Enschede and Hengelo.

### The Twente 'DNA'

As an independent trust, the University Fund has helped to promote the academic climate on our campus in all sorts of ways. It has supported education and research by contributing towards the costs of guest lectures and conferences. It helped to establish the first student associations, and activities in every field of sport and culture have been able to rely on its ongoing support. The Fund made a major contribution towards the costs of the new athletics track, for example, while the Euros Sailing Club received a grant and loan with which to convert an old clipper into the magnificent sailing ship The Ebenhaëzer, the club's home afloat which is often to be seen plying the waters of the IJsselmeer lake and Waddenzee. The University Fund has also co-sponsored the annual Batavierenrace, a road relay which sees runners cover the 175 kilometres between Nijmegen and Enschede, every year since 1975.

The University Fund has also made a significant investment in the university's efforts to maintain contact with its alumni. The first alumni database, the early editions of the alumni magazine and several special events for former students have benefited from its generous support. Such activities do much to instil the characteristic 'Twente DNA' into all our students, past and present.

## **Endowed chairs**

In the 1980s, the University Fund began to devote particular attention to science and research. Many special chairs have been endowed by the Fund, sometimes in association with one or more private sector parties. As a result, it has been possible to pursue groundbreaking research which would not have been possible without such (temporary) funding. In each case, the intention is that the chairs and departments should eventually become self-

# If you support the University of Twente, please consider contributing to the University Fund!

The University Fund exists for the benefit of the University of Twente and its community of staff and students. We are able to provide financial support to various projects thanks to the generous donations of companies, alumni and other partners. The University Fund is a registered charity in the Netherlands ('ANBI status') whereby donations are tax-deductible subject to the usual thresholds and restrictions.

#### Alumni and partners: become a donor

If you support the work of the University Fund, please consider making a contribution or becoming a regular donor. Simply complete and return the form in this magazine or go to: www.utwente.nl/ufonds. The site also includes further information about fiscal benefits, regular donations and named funds.

If you donate €50 or more, we will send you a copy of Aanjager as a thank you gift.

#### Companies: become a 'patron'

We welcome companies as 'patrons' of the University Fund. For a minimum annual donation of €2,500, your company will walk in the footsteps of the founders of the University of Twente. For further information, see www.utwente.nl/ufonds.

If you have special wishes regarding how your donation is spent, or if you simply want further information, contact Alfred Stobbelaar (Director of the University of Twente Fund), email a.stobbelaar@utwente.nl, tel. +31 53 489 8057.

# stichting universiteitsfonds twente

supporting, with the financial resources necessary to appoint professors and other staff.

Grants, scholarships and prizes are a proven way of promoting 'enterprising' education and research. Since 1984, the University Fund has awarded the annual Van den Kroonenberg Prize to a successful entrepreneur with links to the University of Twente. The list of past winners is ample evidence of innovative enterprise à la Twente, and includes the founders of companies such as Xsens, Demcon and Nanomi. The Marina van Damme Grant is awarded to a female graduate to support her further career development, while the Professor De Winter Prize also goes to female top talent in recognition of an international publication. There is also a Professor De Winter Scholarship, available to international students. Since it was established over 65 years ago, the University Fund has been an indispensable partner to the University of Twente, its academic life and its community. The Fund's support of countless projects, activities and events ensures that the intentions of the

original founders are respected, their ideals upheld.

What do the first students to experience the new Twente Education Model think about it? Find out by watching the video below.

# THE TWENTE EDUCATION MODEL: AN INTERIM EVALUATION



# THE TWENTE EDUCATION MODEL (TOM)

The University of Twente strives to produce 'T-shaped professionals'. The upright of the T represents depth: a sound and detailed knowledge of a particular professional discipline. The cross-bar represents breadth: the ability to apply that knowledge in various contexts. Today's students differ from those of previous generations in terms of learning style and their use of various media. The combination of these factors gives rise to five key principles:

- Modular education
- · Project-based learning
- Personal responsibility
- Learning as a team: collaboration
- Being in the right place at the right time.

All Bachelor's programmes at Twente now comprise twelve ten-week modules, each with a clearly defined theme. In 2011, Biomedical Technology was the first programme to adopt TOM (on a trial basis) followed in 2012 by Electrical Engineering. Since 1 September 2013, all first-year Bachelor's programmes use the TOM methodology.

See: www.utwente.nl/tom/en/

Students who graduate in a certain discipline may not work in that discipline throughout their professional career, if at all. It is therefore essential for their education to equip them with a broad repertoire of skills. This is the principle which underpins the new Twente Education Model, known by the Dutch acronym TOM, which was rolled out by all faculties in 2013. This is a good moment for an interim evaluation. BY Hans van Eerden PHOTOS Rikkert Harink

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# INTERVIEW

"Knowledge is freely available on the internet and it can become obsolete very quickly. It is therefore important to teach students how to acquire new, up-to-date knowledge and to assess the value of that knowledge," states Irene Visscher-Voerman, Head of Educational Services and Director of the Education Reform Programme Bureau. "One day, our students may well be required to work on new issues that we simply cannot foresee. This too demands a different set of skills. Reduced government funding and the performance agreements imposed by the Ministry of Education were also factors in our decision to adopt a new approach. Students have less time in which to graduate, which means that education must be more efficient."

#### The Twente 'signature'

TOM has a unique Twente 'signature'. "That is seen in the emphasis on Design, Research and Organization, together with the enterprising attitude we expect. Twente has always offered a sound academic basis, encouraging students to think about the impact of technology in the broader social context. This has now been reinforced." Another typically Twente feature of the new approach is its reliance on project-based learning and large-scale modules which establish the greatest possible cohesion between the various topics and skills.

#### Cohesion

The first evaluation reveals that many students have indeed noticed the cohesion within and between the programme modules. "The project may require them to use the mathematics they have just learned, whereupon they immediately appreciate the relevance. Moreover, it now becomes possible to identify those students who have difficulty with certain aspects. In the past, they would have been at greater risk of dropping out later in the programme, but we can now take prompt remedial measures. In the pilot programmes, pass rates have shown a significant rise."

#### **Pressure**

Students start the 'real' work from the very first day. Teaching staff have had to liaise with their colleagues to an even greater extent than before, conduct more interim assessments, and redesign their course modules where necessary. "Some had misgivings beforehand, but most staff now recognize that project-based learning produces good results. They may take a more 'relaxed' attitude to assessments as a result. The findings of the first evaluation are therefore encouraging, but there are still improvements to be made and we shall continue to provide the necessary support."

#### **Modern education**

Kees van der Graaf, Chairman of the Supervisory Board, sees the introduction of TOM as a very positive development. "I am pleased we have taken this step. Given the magnitude of the change, we have made remarkable progress. This modern style of education is more appropriate to our students' requirements in their professional careers, which entails working within a team in which every member is responsible for the overall results, everyone draws on each other's strengths, and all must work to very strict deadlines. The evaluation was thorough and has revealed a number of points for improvement which we must take to heart. However, the fact that students must now devote forty or fifty hours a week to their studies does not concern me. That leaves plenty of time for other activities, a part-time job, committee work and so forth."

#### **Discipline**

Student Nik Huisintveld agrees, with one proviso. "Yes, there is still time for extracurricular activities but you must be rather more selective. I'm not sure I would agree to take on committee work alongside my studies. That would demand a lot of discipline. Nik started his course in Biomedical Technology (BMT) in 2010, under the old 'regime'. Having taken a year out to work full-time for the programme's study association, he is now in his third year and working according to the new TOM system. "The first module was well integrated and the project itself was well designed. We had to build a robot which could draw on paper, controlled by muscular impulses. The project therefore drew on all the subdisciplines we had studied thus far, from the principles of mechatronic construction to biosignal processing."

# "The academic grounding has been strengthened"

### Depth

Unlike most students. Nik has experience of both education models and can make a comparison. He comes down in favour of TOM, although he recognizes that a module which focuses on a single discipline has its advantages. "It allows you to pursue greater depth. With multidisciplinary modules, you tend to concentrate on those aspects which you will need for your project, even though the overall assessment is somewhat broader." Irene Visscher-Voerman believes that depth will come in time. "The Bachelor's phase is deliberately concerned with breadth, and devotes attention to skills across the board. There is more opportunity to pursue depth during the Master's phase."

# ACTIVE STUDENT

# **NEGLECTING YOUR STUDIES IN AID OF A GOOD CAUSE**

Are you interested in finding out how you can generate media coverage and crowdsourcing in disaster situations? See and hear all about it.



Sec.

Footage of humanitarian disasters on TV can often invoke an overwhelming feeling of impotence. You feel the need to get up off the sofa and do something to help. But what can you do, other than make a donation? BY Lidewey van Noord PHOTOS Rikkert Harink

This was the question that Robert-Jan den Haan asked himself when he saw the devastation caused by typhoon Haiyan in the Philippines in November 2013. He found the answer to his guestion online. He signed up to the Geeklist, an online platform for programmers and designers, and joined a project group that was working on the development of an 'aid app'. Robert-Jan explains, "The aim of the app, status.ph, is to accelerate the provision of aid in disaster zones and make it more efficient. It is an easily accessible communication tool between victims and aid workers: victims use it to say where they are and what they need and the aid workers use it to say what aid they can offer."

Robert-Jan, who was busy completing his Master's degree in industrial design engineering at the time, expected to be working on the project for three days at most. But things turned out quite differently. "After the first day, I realized that the app definitely had potential, but I had doubts about how useful our work would be. It's great fun developing an app like that, but if no one knows that you are working on it, what is the use?"

So Robert-Jan decided to dedicate himself to working on the PR. From then on, he was not only closely involved in the development of the aid app, but also in the overarching Geeklist #hack4good-project. "I worked between 80 and 100 hours per week for a fortnight. In order to attract media coverage for our project, I knew that it was important to narrow the gulf between the 'geeks' and the rest of the world and to make the idea accessible for general consumption." This is why Robert-Jan created an animation film to explain how people can contribute to humanitarian aid initiatives from the comfort of their own home. His idea was successful and his film was featured on national and regional television. But the interest went even further than the Dutch media: "The United Nations and Médecins Sans Frontières (MSF) showed an interest in the app. It was too late for the Philippines, but they want to use the app as an internal communication tool in the next disaster."

Because of all the time he spent developing and promoting the app, Robert-Jan ended up graduating a month later than planned. "But I have no regrets at all about that," he says, full of conviction. "It was absolutely worth it."

# SCIENCE IN TRANSITION: POPULISM OR DEMOCRATIZATION?

A short time ago, the world of science was shaken to its core and the repercussions are still being felt now. Under the title 'Science in Transition', a group of scientists published a manifesto on the worrying state of Dutch science. A one-sided assessment mechanism - the counting of publications has led to a system that produces mountains of publications that are not all high in quality and definitely not all widely read. Furthermore, the research agenda is determined in a way that lacks transparency, as a result of which the taxpayer has little understanding of or influence over how public money is spent. But since science claims to deliver the truth, there is little room for criticism.

According to the people behind Science in Transition, this cannot go on and the tide needs to turn. But they themselves have been hit by a wave of criticism. Society has long understood that science is not infallible, that there are differences of opinion and instances of fraud. Science is actually not only focused on the number of publications, but primarily on quality and relevance. All of the criticism is already in the public arena, providing journalists with an open goal, because the media likes nothing more than an internal dispute. Seen from this perspective, Science in Transition is above all a populist account presented by frustrated scientists.

However, I believe that it is just too convenient to dismiss this development as mere populism. There is no doubt that the ivory towers are no longer as hermetically sealed as they were in the past. But the fact that there may be a little draught in the towers does not necessarily mean that the doors and windows are wide open. The notion that science is not only valuable in itself but is also a societal endeavour is definitely not embraced throughout the academic world.

This is not populism but rather a continuation of the democratization of science that started in the 1960s. Just as doctors ceased merely imposing medical truths on patients long ago, but now engage them in discussion, so the world of science is increasingly committed to entering into an open dialogue with society. Valued for its great expertise, but without any special privileges. Assessed not only in terms of its contributions to science itself, but also its significance for society as a whole.

This reminds me that a university of technology is a great place to work, even as a philosopher. Because we have long known that contributions to society can easily go hand-inhand with good science.

"THE NOTION THAT SCIENCE IS ALSO A SOCIETAL ENDEAVOUR IS DEFINITELY NOT EMBRACED THROUGHOUT THE ACADEMIC WORLD."



**PETER-PAUL VERBEEK** IS PROFESSOR OF PHILOSOPHY OF TECHNOLOGY AT THE UNIVERSITY OF TWENTE.



# UT INNOVATION LECTURE ON QUALITY AND AFFORDABILITY IN HEALTHCARE

# AN ETERNAL LIFE THROUGH THE ETERNAL COLLECTION OF DATA?

At the Innoversum innovation conference at the Grolsch Veste stadium in Enschede on 21 May, the University of Twente presented a programme on one of the great challenges facing our society: how to achieve healthcare that is both high-quality and affordable. The Innovation Lecture was given by Roger van Boxtel, President of the Executive Board at Menzis ("a healthcare insurance company with its roots in Twente") and member of the Dutch Senate. It was introduced by UT alumnus Maarten den Braber, digital health strategist and co-founder of the Quantified Self Europe conference. BY Hans van Eerden PHOTOS Arjan Reef

# MAARTEN DEN BRABER: "The quantified self"

"When I graduated in industrial engineering and management, specializing in healthcare management, the focus was on improving the system and making it more efficient. Since then, I have been asking the opposite question: how can the system make people better and healthier? Thanks to innovations in mobile technology, people are now even able to make a contribution to their own care. Quantified Self is the movement that aims to help people gain an understanding of their health, for example, by testing and collecting data about themselves. It is not only about statistics and graphs; it also helps them to tell the doctor how they are feeling."

"I am now a QS guinea pig, recording metrics about myself, such as weight, temperature and heartbeat and trying out new products on the market. I also share my views about the quantified self and act as consultant to healthcare and other organizations. It is all about teaching people to ask the right questions about metrics. Most people adopt an attitude of wait-and-see and allow themselves to be guided by professionals and their peers. Although it is now possible to collect data on just about everything, I do not predict a wave of hypochondriacs." "As well as the psychological aspects, it is the ethics that interests me most. I am considering doing PhD research, partly at the University of Twente, a university with a unique profile in the field of health – with technology, philosophy/ethics and psychology. This is something it would do well to communicate more effectively. Technology companies across the world look to the Netherlands, which has a good reputation for testing out innovations, in part thanks to the short lines of communication in healthcare."

"In the past, there was the triumvirate of patient, care provider and insurance company. Now there are a whole host of others, from employer to supermarket and even the bank, who are interested in our health. In that arena, who should we allow to set the agenda? You should not tell people what they collect data about, but you can provide them with support. Health insurance companies are already taking tentative steps in this direction. Doing an ECG via a smartphone results in a visible saving in terms of time and money for both the patient and the hospital. The challenge lies in the communication on such matters. The fact that technology enables us to collect data and use it to gain new insights is a positive development. On the other hand, it makes sense to consider the ethical considerations: how should we approach this and how far should we pursue it?"

# SITEIT TWENTE.

# INNOVATIELEZING: WILLEN WE EEUWIG DE DOOD

MR. ROGER VAN BOXTEL VOORZITTER RAAD VAN BEST

# ROGER VAN BOXTEL: "Do we really want 'eternal life' in the shadow of death?"

"I am not here as an insurance specialist intent on talking only about money. What we represent is good healthcare for our 2.1 million members (Menzis is a cooperative). The debate about healthcare also involves highly ethical aspects. For example, does every new development and every super-specialization result in a higher quality of life? The debate on this issue is slowly starting to take shape in the Netherlands."

"The fact is that most of the healthcare costs arise in the final twenty years of a person's life; growing old goes hand-in-hand with ailments and a combination of different illnesses. As a result of the enormous success of medical science, we are hardly able to acknowledge the role of death in our lives any more. But an elderly person with a manifest illness often has other things wrong with them. What treatment will he or she receive and how will that relate to their quality of life? Do we focus on the illness alone or on the person who is ill?"

"Maarten den Braber has examined the issue of what is technically possible. In a few years' time, perhaps there will be a single app that can monitor all our bodily functions. Is that something that we want? Will it lead to an increased demand for healthcare? To greater happiness? Or are we simply going in search of 'eternal life' in the shadow of death? It is not my intention to slam on the brakes, but my question is: is everything that is technically possible also socially desirable?"

"Of course, Menzis is also interested in the concept of the quantified self with a view to prevention. We are therefore 'cautiously supportive'. But could this result in much faster intervention, intervention that will end up costing us money? People are already complaining about the high health insurance premiums; the unbridled expansion of medical symptoms and diagnosis also raises prices. Nevertheless, all of us want the security of an 'eternal life' before death."

"The quantified self reflects our modern age, in which people have become more individualistic and determined to be in charge. This can conflict with our sense of solidarity if we collectively have to pay the bill for all of that quantifying. This could lead to reservations such as: 'It's all very well that you want to collect data about yourself, but perhaps you will also need to bear more of the risk and expense rather than expecting it to be shared collectively.' The dilemma that I am outlining to you is how far can or should this process continue?" IN

**BUSINESS** 

# INTO THE **LAB**

NameDenise LeusinkAge27PositionPhD student in the<br/>department of<br/>Quantum Transport in<br/>MatterProgrammeApplied Physics<br/>MESA+ NanoLab

BY Jochem Vreeman PHOTOS Kees Bennema

UT researchers at the MESA+ Institute for Nanotechnology are hard at work developing chips with patterns at the nanoscale. These chips need to be etched, but traditional lithography techniques cannot create patterns with a resolution of less than one micrometre. The E-beam makes it possible to create these nanochips. Rather than using light, the E-beam emits an electron beam to etch the required patterns.

Scientists and corporate users are queuing up to 'play' with the E-Beam at the University of Twente. "We are using a reservation system to let people book slots of up to four hours per week," explains Denise Leusink. She is using the device for her PhD research project, which she hopes to complete within the next eighteen months. "People were logging in at midnight to book the E-Beam. That's when we tightened the reservation rules, so that everyone could have a chance. We are now looking into getting a second E-Beam. That would be great!"

MESA+ acquired the device, which costs €1.2 million, in 2010. "It's really a kind of electron microscope that you can use for very accurate etchings. The wavelength of visible light is between 400 and 800 nanometres, but with the E-Beam we can achieve resolutions of 20 nanometres. The device has tremendous potential, especially since you can design something new with each new etching. This kind of flexibility is very important for my research and for research in the field of nanotechnology."



"Scientists and corporate users are queuing up for the E-Beam"

ME



# MR BLUETOOTH

Joep van Beurden successfully heads up the chip manufacturer CSR in Cambridge. It may all be down to his technical background, he says. "If I was 18 now, I would choose to study Applied Physics all over again. It teaches you how to make abstract concepts really concrete." BY Marco Krijnsen



# CHIP MANUFACTURER CSR IS NOW FLOURISHING UNDER THE UNCONVENTIONAL STEWARDSHIP OF APPLIED PHYSICIST JOEP VAN BEURDEN.

But if you take a look at the CSR share price in recent years, you see a fluctuating trend with a deep trough in late 2011. The share price then of £1.53 was even lower than at the time of the company's flotation. CEO Joep van Beurden clearly remembers the disquiet felt among shareholders. "When you have bad results in three consecutive quarters, everyone is snapping at your heels. To be honest, I did occasionally wonder whether my expectations would become reality."

Business has improved since then. The CSR share price is now hovering around £7. The improving economy has definitely played a role in this, but Van Beurden believes that the growth is also down to some unconventional choices. Choices that were not received with enthusiasm by everyone involved and that were partly the result of his background at the University of Twente.

#### Hockey club chairman

The fact that Joep van Beurden (b. 1960, graduated in 1982) opted to study applied physics in Twente was a decision he found easy to make. "Even at secondary school, I was interested in how the world works, in the cosmos and in particle physics. When I visited an open day at the UT campus, I knew straight away that I wanted to study here. I was really impressed by the sports facilities. Since I played hockey, I became a member of the DHC Drienerlo and was even its chairman in 1981. In the early days, I lived on campus: Calslaan 14A. It was a very special time."

After completing what was then the equivalent of a Bachelor's degree in Applied Physics, Van Beurden toyed with the idea of taking a fast-track teacher-training course in business administration. But he preferred the idea of a career in business to the academic world. Despite that, he persisted with physics. "I just found the subject too enjoyable and exciting to let go. I still think quantum mechanics is wonderful! In retrospect, I am delighted that I made that choice. Physics is all about how you quantify a problem and then how you realize that in a model. It teaches you how to make abstract concepts concrete. That not only works for scientists, but is equally effective in business. If I was 18 now, I would choose to study Applied Physics all over again. Although I advise my own children to study something they enjoy, I am secretly trying to steer them towards technology."

#### Lecturer and oil trader

During his time in Twente, Van Beurden took a trip to Zambia where he was seconded as a student assistant on behalf of the electrical engineering programme. He later returned to the African country to complete his alternative to military service, working as a lecturer for two years. "I came from Epe, from a very sheltered environment. You suddenly find yourself in a developing country, where you have to learn to survive independently."



## **HOCKEY HOUSE OD308**

Joep van Beurden has great memories of his time in Enschede. 'When I was studying at the University of Twente, it was still Twente College of Technology and its primary focus was technical subjects. It was very much a male bastion: I started studying Applied Physics in 1978 along with 40 first-year students, only one of whom was female.'

'The social side of student life revolved around the many sports associations – there were hardly any student societies at all,' says Van Beurden. 'In the early years, I lived on campus, but as a hockey player, I eventually moved into the "hockey house": OD308 in Oldenzaalsestraat. It is one of the oldest student houses in Enschede. OD still exists today – last year, we celebrated the 45th anniversary with the current residents and the men from the early days there. Out with all of them on the Oude Markt late in the evening, it's just like the old days.'

Joep van Beurden (left), then a student of Applied Physics, in action for DHC Drienerlo in 1979.



His first 'proper' job was a real learning experience. As a physicist, Van Beurden was taken on as a crude oil trader by Shell. "I wanted to force myself to gain practical knowledge of business. I spent a lot of time in Rotterdam, London and New York, buying and selling large boats full of crude oil. It taught me all about trading. It is a perfect first step for an engineer trying to forge a career in commerce."

The next learning experience was at McKinsey in Amsterdam, another deliberate choice. "I still did not feel fully equipped to run a business. As a consultant, you get to see the nuts and bolts of all kinds of different branches of business and encounter lots of different types of problem. It certainly broadened my horizons. I

# "If one market comes down with a cold, the others remain unaffected"

learned how to tackle strategic issues there."

#### **Backing the wrong horse**

Van Beurden then felt he was ready to 'manage something'. He started at Philips, who sent him to Silicon Valley as head of sales in the flat screens division. "It was an interesting business that was developing fast, with technology very close to my own specialism. A dynamic world in which everything changes fast. In a world like that, it is a real challenge to attempt to anticipate the future. You need to continually ask yourself whether sticking to yesterday's successful strategy doesn't actually mean that you're backing the wrong horse now."

Van Beurden knew this when he was headhunted by CSR in 2007. The company, then in existence for just eight years, had developed into a leading Bluetooth chip manufacturer for mobile phones. It was a world player, with Nokia and BlackBerry as its most important customers. Despite this, Van Beurden decided to pursue a radical change of direction.

"I felt it was a risk being too dependent on that single market, and especially on two customers. It was far too small a base for a company with sales of \$700 million at that time. If something happens to the market, the customer or the technology, you are extremely vulnerable. So it made sense to branch out into other technologies: Wi-Fi, GPS and audio. We took over several good companies, gaining access to other markets such as automotive and Bluetooth stereo headsets. It widened our base. If one market comes down with a cold, the others remain unaffected," says Van Beurden.

#### Nokia

It was not easy to explain the company's new direction to everyone. This was especially the case when the CSR share price fell because so much money had been spent on takeovers. "The first thing that you do is to invest. Initially, you have little to show for it. The financial crisis also hit almost immediately after I joined the company. The business had its worst year in 2009. It was a difficult time, but I've never had doubts. Just look at what has happened to Nokia and BlackBerry since then. Those companies are facing real difficulties at the moment." CSR no longer operates in the mobile telephony market. In 2012, Samsung took over its wireless communication department for \$310 million. "There is little money to be made in chips for smartphones. The market in chips for vehicles and headsets is better. They include more CSR technology, which means we can do more as the supplier than simply manufacturing a chip. A few years ago, nobody wanted to listen. Now almost everyone in the company is convinced."



## NEW GROWTH MARKET: THE INTERNET OF THINGS

Cambridge-based CSR makes its money developing semiconductors for the automotive industry, wireless audio manufacturers, printers, navigation systems and more. The companies it supplies include Ford, Samsung, Beats by Dr. Dre, Canon, TomTom and Garmin. In 2013, sales reached \$960 million. CEO Joep van Beurden sees the company's future in combining different technologies. "Take the car for example, where you can listen to music, use GPS to determine the route, telephone via your headset and even watch films on the backseat. It's about integrating audio, Bluetooth, Wi-Fi and GPS in a single platform. We are currently supplying that to almost all car companies." Van Beurden is also a firm believer in the 'internet of things' as a growth market. "TV, PC, telephone, refrigerator, light bulb, smoke detector. All of these devices will be linked together and controlled via the internet thanks to cloud-connecting. Take Nike's Fuelband, for example, which enables you to measure body movements and save, send or share data with your friends via your smartphone. Telemedicine is another example. We develop the chips required for those applications."



What will UT look like in the future? Answering that question may seem like gazing into a crystal ball, but it's not: staff, students and alumni have all been invited to help give shape to the University of Twente's future. By Lidewey van Noord



"We want to take risks, be courageous, combine energy and talents"



An event called Create the UT of Tomorrow took place on Tuesday 1 April. Nearly 300 UT staff members, students and alumni were challenged to give serious thought to the future of the university. Everyone was eager to accept the mission: to go beyond your comfort zone and come up with unexpected and surprising ideas. See a video impression of the event.

# COMBINING ENERGY AND TALENTS FOR A BRIGHT FUTURE

The ambition is clear: our impact on society will be greater than ever in 2020 thanks to the combination of academic excellence, an enterprising spirit and an called 2020 Vision is being developed to help us achieve this goal in the years to come. A think tank event entitled Create the UT of Tomorrow was organized on 1 April 2014 to generate new ideas. Organizer Susanne Wichman were divided into 45 groups and asked to think about the future of the University of Twente. At the end of the day, a jury selected a number of groups and asked them to pitch their ideas. The four winning groups campus, and they've been invited to discuss their ideas with the Executive Board, the deans and academic directors."

The groups were encouraged to innovate, experiment and push the envelope. This attitude fits perfectly with the aim of 2020 Vision. Wichman clarifies: "We want to take risks, be courageous, combine energy and talents and apply ourselves to enhancing our visibility in the region, in the country and in the international arena.

A few of the key themes from Create the UT of Tomorrow: how will the campus develop into an inspiring meeting place? What impulse is needed from our teaching and research programmes to get students to make the jump to entrepreneurship? How can we intensify the links between the university and industry, and what role does the Twente region have to play in this process? Wichman gives an example: "The Mixed Vision group, winner of the Create audience award, came up with 'Festivaliz'UT': a science festival drawing people to the university to see what's on offer in the field of education and research."

Did you miss the Create event? Don't worry! Wichman: "We've asked Computer Science and Business Information Technology students to create an electronic 24/7 think tank web app so that we can exchange even more ideas."

# IN BRIEF



# **SKATING SUCCESS**

No one can have failed to notice the amazing performance by the Netherlands' speed skaters at the Winter Olympics in Sochi. They returned home with no less than eight gold medals! But did you know that a factor in their success originated in a wind tunnel at the University of Twente? Professor Harry Hoeijmakers tested twenty different fabrics in the wind tunnel on models of arms, thighs and lower legs to see which fabric generated the least air resistance. Professor Hoeijmakers describes his contribution to the Dutch sporting success as modest "but important nonetheless".





# VAN DEN KROONENBERG PRIZE

UT alumni Marc Woesthuis and Kathy van Eijkelenburg of TRiMM are the winners of this year's Van den Kroonenberg Prize. Each year, this enterprise award is given to a young entrepreneur with a demonstrable link to the UT who has earned a reputation for being a cut above the rest. TRiMM is a fullservice online agency that provides digital strategy and solutions to the business community. According to the Van den Kroonenberg Prize advisory committee, the company more than meets the winning criteria. "It is a stable business with a clear vision and steady growth. Kathy and Marc are entrepreneurs with definite ideas about how they want to do business."



# TWIN DROP DOCS

Obtaining your doctoral degree is a special moment in your life. Sharing that moment with your twin brother or sister makes it extra special. But identical twins both defending their doctoral thesis on the same day is truly remarkable! Just such a remarkable event occurred recently at the University of Twente. Twin sisters Jolet and Riëlle de Ruiter obtained their doctorates at two consecutive ceremonies. Both conducted their PhD research at the Physics of Complex Fluids department. Jolet studied how air affects falling drops, while Riëlle's research centred on oil droplets.

Measured by its share of the top 10% of most cited publications, the University of Twente ranks 102 in the world.

# IN BRIEF

More students than

ever before obtained

their doctorate at the

**University of Twente** 

last year: no less than

220.

## TWITTER BACKS CANCER SCREENING

Researchers from the University of Twente and TNO are being allowed to use Twitter data to investigate the impact of social media campaigns on the field of cancer screening research. Earlier this year, Twitter announced that it was willing to make its data available to a handful of research institutes that put forward a good research proposal. From the 1300 research proposals it received from sixty countries, Twitter selected just six. Among them was the proposal submitted by the University of Twente and TNO.



# TIMBER TALLY

For forestry and climate research, it is vital to measure the amount of timber in a forest. However, this has always presented scientists with an extremely difficult task. Anahita Khosravipour of the University of Twente has risen to the challenge by developing a new method of collecting tree data, using a laser beamed from a helicopter. Among other things, the laser can determine the height, size, shape, density, structure and position of the trees. Her approach is more accurate, more efficient and cheaper than existing methods.

# **HYBRID MEMBRANE**

University of Twente researchers have developed a new type of membrane to separate gases, for use in the chemical industry. What makes this hybrid membrane unique is the fact that it goes on working at temperatures and pressure levels which are too high for the polymer membranes currently in use. This new invention has the potential to achieve significant energy savings in the chemical industry, which is responsible energy consumption.



# **GOOGLE MAPS INDOORS**

The University of Twente is the first university in the Netherlands where you can find your way around using Indoor Google Maps. This interior version of the popular map service helps users find their way around public buildings.

A record number of **8,614** runners took part in the Batavieren Race in **2014**. It was the **42nd** time that the world's largest relay race was held.



# **TEN SPORTING ANNIVERSARIES**

In September and October 2014 no less than ten Drienerlo student sports clubs are celebrating their 50th anniversary. To mark this event, nine of the ten sports clubs have joined forces to organize a major tournament lasting two weeks in October and November. The clubs will compete against each other in eight different disciplines: football, volleyball, hockey, handball, badminton, athletics, judo and basketball. At the end of the tournament a medal count will be made to see which club has the most multi-talented athletes in its ranks. A big closing party will be held on 20 November, the final evening of the tournament, to which all are invited.

So there will be ten festive anniversaries in two months, but which of these ten sports clubs is really the oldest? Although D.A.V. Kronos (founded on 17 September

# "Great, then you'll be setting up an athletics club..."

1964) is the oldest student athletics club in the Netherlands, another Drienerlo club saw the light of day two weeks earlier: the sailing club D.Z. Euros was set up on 2 September 1964. For practical reasons there will be no sailing in this big sports clubs tournament but D.Z. Euros will still be competing for the medals.

The table-tennis club Thibats was set up on the same day as D.A.V. Kronos, and they were joined by another three clubs on 22 September 1964: DIOK (badminton), v.v. Drienerlo (football) and DHC (hockey). Two more followed a day later: Arashi (Asian martial arts) and Harambee (volleyball). The handball club Cabezota was set up on 1 October, and the basketball club Arriba was founded two days later on 3 October. These ten student sports clubs can now boast of being the oldest on the campus.

And it's no coincidence that all these sports clubs were set up around the same time, as recounted in the story In één uur twintig sportverenigingen ('Twenty sports clubs in one hour'), written by Nico de Wind and published in the book Never Ending History; de geschiedenis van sport op de campus en de Sportraad Universiteit Twente ('Never Ending History: the story of sport on the campus and the University of Twente Sports Council') (1997). The meeting held in 1964, which was attended by all students of Technical University Twente (as it was then), went roughly as follows:

"Who does athletics?" A hand was raised in the hall. "What's your name?" "Han Paus..." "Great, then you'll be setting up an athletics club... [...] OK, who's next..."

Not all the sports clubs have survived through the years. The marbles club De Gouden Stuiter, for instance, which according to legend mostly gained a reputation for the way it efficiently converted the THT grant into casks of beer, is no longer with us. But over time many other clubs have come into existence, meaning that at UT you can now get involved in go-karting, horse riding and gliding.

Would you like to know more about all the anniversary activities and the history of these Drienerlo sports clubs? Then take a look at **utwente.nl/sportlustrum** 



# **CONNECTIONS CREATE ENERGY!**

On Wednesday 16 April this year the Utrecht Alumni Circle organized an evening for start-ups. Four UT alumni presented their enterprises and set out several strategic issues for those who were present. This lively and instructive evening was attended by around thirty people. Following the session, the participant Art Ligthart (@ArtLigthart) tweeted: "Nice session with entrepreneurs @alumniUTwente: from manure processing via project and policy analysis tools to @CSSImotion. Connections create energy!"

## WANT TO BE AN APP TESTER?

This summer UT will be the first university in the Netherlands to launch a mobile app specially for alumni. The app is known as UTwente DNA and gives alumni the chance to share information and to remain in contact with each other. This is mostly based on content in social media. Alumni who are active on Twitter are warmly invited to contribute to the development of this unique initiative. Would you like to help test the beta version of the app? Then send us an email stating your full name, your Twitter user name and your date of birth to **alumni@utwente.nl**!



UT alumni vliegen uit over de hele wereld. Hier ziet u waar ze wonen en werken. Verhuisd? Nieuwe baan? Laat het ons weten! www.utwente.nl/alumni

#### UNIVERSITEIT TWENTE. /Alumni Nieuwsbrief



### **NEW NEWSLETTER**

The Alumni Newsletter has received a full makeover! It has a new format that focuses on more personal stories about UT alumni: where are they now, what have they achieved? There's also an overview of upcoming events that may be of interest to you, and news items about UT. What's more, we've set up a prize competition! You can read it all in the newsletter, which you receive at your UT alumni email address. Have you forgotten your email log-in data? Then send an email to alumni@utwente.nl, giving your full name and your date of birth. We'll then send you your data as soon as possible.

#### **ALUMNI ONLINE**

# Twelve thousand members on LinkedIn and Facebook

The University of Twente group has over twelve thousand members on the business network site LinkedIn. This group comprises UT alumni, students and staff.

Via this interactive group the participants receive information about the university. advance announcements of (alumni) meetings and company visits. Under the heading 'promotion' alumni can also post their own messages about events such as training sessions and conferences. Questions and appeals of a more substantive nature can be posted under 'discussions', while job vacancies are announced as well. Another interesting site to visit is the new Alumni University Facebook page at www.facebook.com/ AlumniUT. The Facebook page includes historic and contemporary photos and stories relating to the campus. If you have a special story or an interesting photo, then please mail it to alumni@utwente.nl.

### UT ALUMNI ON THE MOVE

Martin Spit, INF'95, was appointed managing director at Accenture in New York in December 2013. Moreover, since May 2011 he has been director at The Boston Consulting Group. Earlier in his career he was a manager at Ernst & Young and a partner at Mitchell Madison Group and Baldwin Bell Green.

■ Nienke Meerdink, IBA and BK'05/BA'06, has been declared Talent of the Year 2014, an award for the most talented young care manager, by the trade journal Zorgvisie. Meerdink works as a partnership manager and project manager at Rijnstate Orthopaedic and Surgical Clinic at the Zevenaar branch of the hospital Rijnstate Ziekenhuis.

Loes Brilman, IBA and BK'10, has won the CFE Award Albert J. Rädler Medal 2014 for her Master's thesis 'Emigration and immigration of a business: impact of taxation on European and global mobility'.

**Casper Peeters, TN'99**, and Per Slycke, TN'99, sold the UT spin-off Xsens to Fairchild Semiconductor in January 2014. The buyer is a large American company that is regarded as one of the founders of the semiconductor industry; its products include sensor packs that are used in the gaming and film industries to reproduce human movements as naturally as possible.

The UT scientist **Johan van Ravenhorst, WB'08**, has won the prestigious JEC Innovation Award at the JEC Europe Composites Show in Paris. He received the award for BraidSim, a simulation program for the overbraiding process by which complex composite products can be designed and developed faster and more reliably.

In January 2014 **Gerard Slootweg, EL'04**, took up a post as Director of Product Management at Philips Healthcare. His previous jobs included work as an R&D engineer at Brainquiry and BerkelBike. In October 2007 he started work at Philips Medical Systems as a Technical Application Specialist.

Robert-Jan Vermeulen, TBK'91, was appointed as Deputy Director of Save the Children Netherlands in January 2014. Since April 2012 he had been Communication & Marketing Manager for the same organization.

In February 2014 the new book by **Diederik Jekel**, **TN'08/APh'10**, was published by Atlas|Contact: Beta voor alfa's ('Science for Arts Students'). In this book he explains the most important physics and astronomy problems using examples that everyone can understand and recognize – even students of the arts and humanities.

In February 2014 **Martin R. Dibbets, WB'94**, took up the post of Director Netherlands at the engineering firm VIRO. After graduating he started work at VIRO as an engineer in 1994. He later rose to the rank of branch manager and from February 2013 to January 2014 he worked as Commercial Technical Deputy Director. In March 2014 **Han Fennema, INF'86**, became the new CEO of Gasunie, and Chairman of the Board of Directors. Since January 2014 Fennema had been a member of the Board of Directors of Gasunie. He had previously held posts at, among other companies ExxonMobil, Esso Aardgas, Eneco and Enexis. In addition he was the chairman of Netbeheer Nederland from 2011 to December 2013.

The financial journalist **Tjibbe Hoekstra, EPA and BSK'07/PA'08**, has been working as Senior Reporter for Expert Investor Europe since March 2014. He keeps European investors informed about issues such as investment trends and developments in legislation. In addition he analyses and describes the results of the EIE research department.

Takeaway.com, the parent company of enterprises such as Thuisbezorgd.nl and founded by director and former UT BIT student **Jitse Groen**, has received an investment of 74 million euros. The investment companies Macquarie Capital and Prime Ventures will be putting money into the company.

On 5 May 2014 **Martha Riemsma, TCW'00**, was appointed the new editor-in-chief of the newspaper De Twentsche Courant Tubantia. In recent years she has worked as an independent entrepreneur on a number of innovation projects within Wegener.

In April the new book by **Ellen de Lange-Ros**, **TBK'94 and PhD MB'99** was published: Een zaak van zacht werken ('A matter of soft work'). This is a business novel that sets out the advantages of 'soft work' over hard work. The business coach and entrepreneur De Lange also previously published the management novel Een zaak van Fans ('A matter of fans') about earning money with online marketing – this book was on the bestseller list of management books for over fifty days.

Wim Buursen, CT'80, and Theo Klijn, WB'77, recently sold their company Humeca to the holding company Holland Venture. Humeca was set up by them in 1981 and supplies equipment for skin transplants to burns units and hospitals in 66 countries. Both alumni retain a relationship with Humeca as advisors.

You can find the latest people-related news on **twitter**. **com/alumniUTwente**.

Have you yourself begun a new job? Do you know someone who has done something special or won a great award? Please send your news to **alumni@utwente.nl** 

## **PUBLISHING DETAILS ALUMNI NEWS**

Got any questions or suggestions? alumni@utwente.nl Telephone (053) 489 2104 Twitter: @alumniUTwente Alumni Office www.utwente.nl/alumni Changes of address Subscribing or unsubscribing: email newsletter Request forwarding settings



# MAKE IT POSSIBLE!

Herman Hazewinkel, Chairman of the University of Twente Fund

The University of Twente Fund has played an important role as a motor of the entrepreneurial university and it will continue to do so in the future. For decades the Fund has been facilitating and stimulating the university's infrastructure. It functions as a booster, as a pinch-hitter. It comes into action when a push in the right direction is needed. After all, a lot of effort and energy is required to produce top performance in the field of education and research, now and in the future, and also to create an attractive quality of life on the campus. So extra support remains essential - now more than ever before. In our role of University Fund we are happy to provide this help, thanks to the contributions from our donors: alumni, partners and companies. Help us to maintain these activities and facilities! Sport, Culture, Study Trips and Symposia: Make It Possible!

Go to: www.utwente.nl/ufonds or fill out our authorization form.



### STUDY TRIP TO A TRUE HIGH-TECH COUNTRY

In February, twenty-one electrical engineering students went on a three-week study trip to Japan. The trip was arranged by the SPOCK committee of the Scintilla student association – and all the participants were involved in organizing the trip. The committee chairman Robert Grootjans recounts: "All in all, we spent a year on this." According to Grootjans, Japan was a very interesting country to visit in terms of technology: "Although Japan is suffering quite a lot from the crisis, there's a huge amount of industry and innovation in the country. To use the terms applied by the University: Japan is a true high-tech country." During the study trip, which was in part made possible by the University of Twente Fund, the students visited twenty companies, universities and institutes.

This year even more UT study trips are being planned, to destinations including South Africa, Indonesia, Chile, India, Argentina and the United States.

"To use the terms applied by the University: Japan is a true high-tech country."

#### EXCLUSIVE BENEFIT CON-CERT FOR UT RESEARCH INTO ARTHRITIS

On Friday, 12 September 2014 a unique and highly exclusive benefit concert will be held at Het Loo Palace. The event is being organized in conjunction with the Valerius Ensemble of the Netherlands Symphony Orchestra, the Dutch Arthritis Foundation, the University of Twente Fund, Maison van den Boer and Het Loo Palace, and is intended to raise funds for the Dutch Arthritis Foundation. Ultimately the money will benefit the research into repair of tissue affected by arthritis, currently being conducted by Prof. Marcel Karperien at the University of Twente. A ticket for the concert, including a VIP dinner at a spectacular location within the palace, costs €500. During the concert several members of the Valerius Ensemble will be playing instruments with a special story: they have been made by a violinist who began building instruments after she had to stop playing the violin due to rheumatism. If you would like to take part in this fundraising dinner, please contact Alfred Stobbelaar, Director of the University of Twente Fund, via a. stobbelaar@utwente.nl or T. 053 489 8057.

### DONATION FOR BREAST CANCER RESEARCH

A foundation that wishes to remain anonymous has made a donation of €50,000 via the University Fund for research into detecting breast cancer. For several years, the research group headed by the UT professor Wiendelt Steenbergen and the Medisch Spectrum Twente hospital have been working on a completely new, painless technique for breast cancer screening, known as 'pammography'. Steenbergen explains: "The donation means in principle that we will be able to employ a researcher for a year." Earlier, crowdfunding was used to raise almost €10,000 for the research work.

For more information: www.pammografie.nl.





#### BRECHTJE RIPHAGEN WINS THE MARINA VAN DAMME SCHOLARSHIP

The committee of the University of Twente Fund has awarded the Marina van Damme Scholarship to Brechtje Riphagen. Riphagen studied Biomedical Technology at UT and conducted research into multi-infusion at UMC Utrecht: this is the simultaneous administration of multiple drugs to babies in incubators. Together with UMC she worked to develop an infusion line that allows the precise and simultaneous administering of medication.

In early 2010 the development work was halted due to lack of funds, but Riphagen didn't give up and in September 2011 she set up her company Innofuse. Her aim was clear: to make the new infusion line available worldwide to all incubator patients. In January 2013 she resigned from her regular job to fully concentrate her energies on realizing this dream. Riphagen: "I was on the incubator ward and I was standing by the bed of a seriously ill baby – she was twenty-six weeks old and she weighed less than a kilogram. I suddenly realized that all my knowledge from the years of research would only have an impact if this product reaches the market. That moment is what still drives me today."

Through her company Innofuse, Riphagen wants to make the transition to the market, from research to enterprise. She will use the Van Damme Scholarship, comprising a work of art by Mohana van den Kroonenberg and a sum of €9000, to further develop her company and her entrepreneurial skills, and to conduct international market research into the commercial feasibility of the infusion line.

To quote from the jury report: "Riphagen is highly talented, unusually ambitious and she always sets her sights higher. She has no time for glass ceilings. She aims for the maximum possible, while keeping in mind the societal impact of her achievements." According to the jury, she is the epitome of the Marina van Damme Scholarship.

The scholarship was enabled by a donation by Ms M.A. van Damme-Van Weele, who in June 1965 was the first engineer to gain a doctorate at Twente Technical College, as it was then.



#### EUROSIM GIVES INTERNATIONAL STUDENTS AN INSIGHT INTO EUROPEAN DECISION-MAKING

From 4 to 7 January, Enschede was the administrative centre of Europe. In a manner of speaking. For four days, some two hundred students came together on the campus to simulate the decision-making processes of the European Union. The UT student of European Public Administration (EPA) Mathias Quickert was one of the participants and acted as the alter ego of the Greek prime minister Antonis Samaras. "For a little while I didn't feel like a student."



# **MONEY RAISED FOR BATA4LIFE**

The Donders Devils and the medical male fraternity Ferus Ebrius have together raised over €2000 for Bata4life. This makes them, as fundraisers, the two most successful student teams that took part in the Batavieren Race, the biggest road relay race in the world. Bata4life, an initiative of the Batavieren Race, the University of Twente Fund and the Dutch Cancer Society, gave participants the chance to collect money for cancer research in which the University of Twente is involved.



# CREATE AND NAME YOUR OWN FUND

You can support the University of Twente with a one-time gift, regular donations or a legacy to the University of Twente Fund. Another option is to set up a fund in line with the goals of the University Fund, and for you yourself to determine its name. In this way you retain complete control over how your contribution is put to use. Information: www.utwente.nl/ufonds a.stobbelaar@utwente.nl

#### University of Twente Fund

Postbus 217, 7500 AE Enschede Facebook: www.facebook.com/ UFondsTwente e-mail: universiteitsfonds@utwente.nl

Bank account: IBAN NL09 ABNA 0592 7191 89 In the name of Stichting Universeitsfonds Twente, Enschede

# WERE YOU THERE?



![](_page_31_Picture_2.jpeg)

# INNOVERSUM

![](_page_32_Picture_0.jpeg)

# CAPTAIN'S DINNER

![](_page_32_Picture_2.jpeg)

Trudy Vos and Marijke van Hees.

Jolanda van Tellegen and Rob de Koning.

n and

Stefan Kuks and Miriam Luizink

"The University of Twente is the leading entrepreneurial university, and entrepreneurship is in our DNA"

![](_page_32_Picture_8.jpeg)

Dennis Schipper and Marjan Weekhout.

![](_page_33_Picture_0.jpeg)

# **SOLAR TEAM TWENTE**

![](_page_33_Picture_2.jpeg)

THE RED ENGINE

First place in the World Solar Challenge in 2015 – that's the ultimate goal of Solar Team Twente. The application process for the new team members is now in full swing and the members of Solar Team Twente hope to present their new recruits at the start of July, thus also marking the first step towards final victory in Australia. The University of Twente and Saxion will be making extra investments in Solar Team Twente, and the sponsors are being asked to follow the same line. After achieving third place in last year's solar race, 'The RED Engineers' are now going all out for complete victory. The new student team and management hope to create a broader base in the region. The new team not only needs outstanding technical talent but must prove itself in terms of communication and entrepreneurial spirit, too.

The increased support for Solar Team Twente is helping to spotlight Twente in the fields of High Tech Systems & Materials (HTSM), innovation and enterprise.

![](_page_34_Picture_0.jpeg)

# **POSTGRADUATE EDUCATION**

The business magnate Henry Ford already said it a long time ago: "Anyone who stops learning is old, whether at twenty or eighty. Anyone who keeps learning stays young. The greatest thing in life is to keep your mind young." BY Lidewey van Noord PHOTOS Gijs van Ouwerkerk

# FOR THE YOUNG IN SPIRIT

The passion to keep developing is a special human quality. In certain specialist fields such as the medical sector, this kind of development is regarded as an essential part of one's career. But postgraduate education is equally high on the agenda in a wide range of other sectors where new knowledge is needed. Oscar Peters, Director of Studies at the Professional Learning & Development (PLD) department of the University of Twente, says: "In various sectors we can see opportunities that are not yet being used. Management in the care sector, financial services, transport and construction, to give just a few examples. A professional whose career starts with a technical degree may, for instance, feel the need to learn more about management and administration so as to enable a new career step."

Klaasjan Visscher, lecturer at various professional graduate programmes, adds that actually it is often the more experienced people who gain new insights. "Here they learn to take a systematic view and they can practice in a protected environment, without the critical gaze of colleagues. By first taking a step back they find solutions that they wouldn't previously have thought of. Or they get more involved in organizational aspects, because now they can use the right arguments to support their gut feeling about something. This is something that participants are often really pleased about."

![](_page_34_Picture_6.jpeg)

Alumni of professional graduate courses often experience major benefits for their career. That's because the new knowledge and insights have given them selfconfidence, and because contacts with other participants have led to new approaches and a broader network. Fresh knowledge provides competitive advantages for companies, too. Peters: "As a university we have the latest international know-how, and if we don't have it then we can acquire it. So we can also show organizations where the sticking points lie, and design and implement a highly targeted education programme for them."

Professional Learning & Development not only aims to increase the opportunities for individuals and companies - the department also aims for a higher ideal. Peters: "The University of Twente is in a position where it can contribute to society, and we think it's vital that we actually do this." This is why each programme includes a component in which the participants reflect on corporate social responsibility, i.e. on issues relating to the areas of sustainability, power, integrity and ethics: issues which play a role in a company's daily decisions. Peters: "Our greatest ambition is to educate people who can make a difference to society."

# THE QUEST FOR INDIVIDUALIZED CANCER TREATMENT

![](_page_35_Picture_1.jpeg)

# AN ENTERPRISING INVENTOR

Leon Terstappen has won many prestigious awards over the past thirty years. They recognize his pioneering work in identifying blood stem cells and in developing techniques to detect cancer cells in blood. He describes himself as an inventor, but enterprise is also very much in his own blood. By Kees de Rijk PHOTOS Rikkert Harink

![](_page_36_Picture_0.jpeg)

Leon Terstappen had yet to complete his postgraduate training as an internist when he was asked to join a doctoral research project examining the differentiation of white blood cells in leukaemia. "As a doctor, I felt slightly out of place among the technologists and physicists, but between us we devised something which is now a standard component of most haematology analysers. Before long I was approached by an American research lab. I accepted the offer and spent many years on the other side of the 'pond'."

Leon can now look back on thirty years of research and development in cellular biophysics. His many innovations have achieved global recognition. In 2009, he was awarded the Prix Galien, often dubbed the 'Nobel Prize for Medical Technology' for his technique which detects circulating tumour cells (CTCs) in the bloodstream. On his office walls hang dozens of plagues, each representing a patent issued in his name. "I am a doctor," he explains. "If I see a problem, I look for a solution or a way around that problem. That's how you become an inventor."

### Cytometry

Most of Terstappen's innovations are in the field of cytometry: identifying the various physical, chemical and biological properties of cells in a fluid such as blood. Ever since that first doctoral research project, he has sought ways in which to refine the detection of tumour cells in blood. "People do not die from a tumour which has been surgically removed, irradiated or destroyed using chemotherapy. They die - often many years later - because malignant cells from that tumour spread to other parts of the body via the bloodstream: the process known as metastasis. These cells are mutations of the originals, with different properties. To provide an

effective response, doctors need information at the cellular level. We have developed a technology which literally 'catches' the tumour cells so that their specific properties can be determined."

#### That one tumour cell

Modern cytometers not only analyse thousands of cells per second, they isolate individual cells and sort them according to specific characteristics. But how can you be sure that among all those millions of cells is the one tumour cell which will prove fatal? Armed with the knowledge he gained through his stem cell research, Leon Terstappen joined the start-up company Immunicon, where he developed the CellSearch test. Antibodies carried by microscopic particles of iron are introduced to a small (7.5 ml) sample of blood. The antibodies attach themselves to tumour cells, which can then be 'fished out' using a magnet. These cells are then exposed to antibodies which reveal their specific characteristics, matching them to one of more than a hundred different types of cancer which have been identified at stem cell level.

#### **Technology transfer**

Terstappen returned to Twente in 2007 – 18 years later than originally planned - to lead a research group concerned with improving cancer diagnostics and developing new technologies for 'point-of-care' applications: laboratory tests at the bedside. One such technology is a small machine which can measure the T-lymphocyte count in a single drop of blood. "This can be crucial in the treatment of HIV and will be of immense value in remote areas of Africa." The combination of costeffectiveness and ease of use make Terstappen's applications ideal for market development by spin-off companies, which in turn fund the fundamental research through which he improves their effectiveness: technology transfer in its purest form.

#### One hundred per cent

Although his CellSearch desktop machine met with worldwide acclaim, Terstappen was still not satisfied. There is a fifty per cent chance that a 7.5 ml sample of blood is too small to find that one elusive tumour cell. The only way to increase sensitivity to one hundred per cent is to filter the patient's entire bloodstream."

# "Cancer – like HIV – will eventually become a chronic, manageable disease."

In 2012, Leon Terstappen received a European research grant of six million euros with which to study the clinical relevance of his latest invention, the CTC Trap. This technology will indeed filter all the patient's blood, and will do so within thirty minutes. In 2016 we will know whether the CTC Trap fulfils its promise and is able to detect metastasis in all patients with cancer of the breast, prostate or colon.

### A manageable disease

Whether the ability to catch all tumour cells will have a therapeutic effect in itself remains uncertain, although once a cell has been removed from the bloodstream it can do no further harm. "The most important thing is that we can identify the specific properties of each cell. Once we know precisely which types of cell respond to which treatment, patients can be given a cocktail of drugs which will be far more effective than any generic treatment. By 'personalizing' the treatment at the cellular level, cancer - like HIV - will eventually become a chronic, manageable disease."

![](_page_37_Picture_0.jpeg)

# KEEPING TALENT

The University of Twente and Saxion University of Applied Sciences have been responsible for countless successful start-ups and spin-offs. Gerard Sanderink sees this as ample proof of Twente's potential. At the same time, most of these companies remain relatively small, often with fewer than one hundred employees, and there is a risk that R&D activities will become fragmented. Twente was once a world centre of the textiles and metals industries. In Sanderink's opinion, high-tech product development must be accompanied by actual production - a fullyfledged manufacturing industry - if the region is to regain its former economic importance and offer adequate employment

opportunities. He therefore intends to open the Sanderink Technology Centre, which will not only coordinate R&D efforts but promote 'total solutions' in the form of end products rather than semimanufactures and components for assembly elsewhere. Sanderink hopes that the new centre will stem the 'brain drain', making it more attractive for UT and Saxion graduates to remain in the region. His plans will also create new jobs for those with technical and vocational qualifications.

#### **Scholarships**

Santerink has another proposal intended to bring top talent to Twente, and more importantly, keep it here. He is to endow a number of scholarships which will bear his name. Excellent students at UT and Saxion can apply for a scholarship of up to €10,000 a year. They must, of course, meet a number of selection criteria and their progress will be closely monitored. They must also undertake to work for a local company for at least three years after graduation. Five scholarships will be available to UT students in the new academic year. In a time of decreased government funding, these initiatives are more than welcome.

#### Connection

Gerard Sanderink (b. 1948) is devoting a significant part of his personal fortune to the new initiatives. He was born and bred in

# DEPARTURE POINT TWENTE

![](_page_38_Figure_1.jpeg)

# TWENTE ALUMNUS AND TOP BUSINESSMAN ANNOUNCES NEW INITIATIVES FOR THE REGION

Top businessman Gerard Sanderik intends to breathe new life into the Twente region. He plans to set up a new technology centre and will offer scholarships to support top talent. The Twente alumnus, who now heads companies such as Centric and Strukton, wants to see Twente regain its position as a flourishing industrial region. BY Wiebe van der Veen

# ON BOARD

Twente and feels a very strong connection with the region. In the mid-1970s, he studied electrical engineering, business management and applied mathematics at the University of Twente (then the Technische Hogeschool Twente). He rose to prominence as President and CEO of Centric, one of the Netherlands' largest ICT companies. In 2005, he purchased a majority shareholding in the engineering firm Oranjewoud, going on to acquire Strukton, specialists in infrastructure, and Dutch Solar Systems, which produces sustainable energy solutions. His companies operate internationally, and many regularly call on the knowledge and expertise of Twente spin-offs. Sanderink has

watched with dismay as some R&D and production activities have shifted away from our region. This is partly because other countries and regions offer a more attractive work setting for top talent, but also because the high-tech infrastructure in Twente lacks cohesion. The plans of the Gerard Sanderink Foundation therefore tackle the problems from two angles: talent must be retained, and there must be an attractive setting which fosters personal and career development.

Sanderink is currently in talks with Kennispark Twente, the City of Enschede, the Province of Overijssel, the University of Twente, Saxion, the Ministry of Economic Affairs and the property development company Oost NV with regard to the proposed technology centre. He hopes to develop a high-profile location within Kennispark Twente by 2019. A selection committee has been formed to award the first Sanderink Scholarships. It includes representatives of the University of Twente, Saxion University and the Gerard Sanderink Foundation.

For further information see: www.stichtinggerardsanderink.nl

![](_page_39_Picture_0.jpeg)

# HUIZE COOK

Even from the outside, it is obvious that Huize Cook is occupied by students. Alongside the front door of this semi-detached house on Oliemolensingel is a cluster of old bicycles, while in the window there is a poster for the Audentis student association. A huge Grolsch beer bottle stands on the windowsill, accompanied by an even larger glass. And, inexplicably, the pathway is graced by a pair of shoes. BY Lidewey van Noord PHOTOS Tim Rijnhout

# "IT'S A BIT GROTTY, BUT NO WORSE THAN IT USED TO BE."

I am sitting in the lounge, surrounded by the current residents of Huize Cook: six young men aged from 19 to 22. Someone hands me a mug. "Just pretend it's coffee," he says and everyone laughs. It is a Friday morning in the middle of the exam period but all six housemates are all here to meet me. The atmosphere is relaxed. Alex Kamphuis, the senior resident, explains what keeps this little 'family' together. "Every afternoon we all go shopping for groceries together. Whoever will be cooking dinner pushes the trolley around the supermarket while the rest of us wait by the coffee machine. Someone else pays and we roll dice to decide who will do the washing up. All this takes up about three hours every evening but it is always fun."

"The house was given the name Cook by its first residents," says Sietze Berends who is one of the youngest members of the group. "It became a student house in 1988, founded by members of Audentis. They decided to spin a globe, point to a random country and adopt the name of whoever discovered that country." Presumably, the finger of fate fell on Australia, New Zealand or Hawaii, for it is Captain James Cook's portrait that now hangs in the lounge. There is also a picture entitled 'The Tree of Wisdom', from the branches of which hang the names of past residents, the elite group known as 'Cookers'.

One such 'Cooker' is Geert-Jan Bruinsma, founder of the Booking.com travel website, who lived here in 1988 and 1989. "The bonds you form in this house are for life," he states. "Some of my best friends are Cookers." Former residents like to stay in touch and often get together for an evening out. "Apart from social contact, many business relationships have been formed among our network," says Raoul Zaal, another of the original residents who lived here from 1988 till 1993. He is now Director of Marketing & Sales at Feenstra. "Booking. com owes its existence to Cookers, several of whom became investors and shareholders at the very outset. We are a diverse group of intelligent guys with different skills and knowledge, and an extremely extensive network. That's always useful if you need advice or investment. Contacts remain close because they are based on a very firm foundation: only guys we genuinely like are invited to live in Huize Cook. We also try to help the current generation of Cookers where possible, with internships and suchlike."

I am treated to a guided tour of the house. The six students share three floors with a small kitchen, one (slightly grubby) bathroom and one toilet. "And there's a washbasin," someone helpfully informs me but I pretend not to hear. In the lounge hangs a large wooden board with hooks. On each hook is a beer

![](_page_40_Picture_5.jpeg)

STUDENT HOUSE

tankard: one for each former and current resident. There is one rule: those tankards must never be washed. To avoid a build-up of dust, Cookers make a point of using them for their intended purpose as often as possible. One of the many opportunities to do so is the annual Christmas dinner. Raoul has not missed Christmas at Huize Cook in over twenty years. "It's always a great party," he says. "I look forward to it for weeks. As I approach Enschede in the car I find myself speeding up, like a horse that can smell its stable. Very little has changed over the years. Some of us still use the house as a 'crash pad' after a night out in the city. Cookers are always entitled to a bed for the night."

# "The bonds you form in this house are for life"

Geert-Jan is still very much involved in the life of Huize Cook. "It's a bit grotty, but no worse than it used to be. I always take part in the annual field trip, which helps to renew old ties. We have been all over Europe together: Mallorca, Belgrade, Madrid and Istanbul, for example. Last year we added Berlin to the list. It's always great fun to go out with the lads, though odd to think that some of them weren't even born when I was living in Huize Cook."

The back door has to be opened with a spoon because the "someone threw the handle away." There are yet more shoes in the garden. I mention that I had noticed a pair on the front path. "Oh, those are mine," says Tim Rijnhout, who dashes outside to retrieve them. "Tim had to take his underpants off before coming in," someone explains a matter-of-fact tone. My quizzical expression elicits further details: anyone who forgets his key is not let in until he has posted his underpants through the letterbox. Tim found himself in this predicament only this morning. Having stripped off in the middle of a nice residential neighbourhood in Enschede, he simply forgot to bring his shoes indoors. It happens to us all.

If you would like your (former) student house to feature on facebook. com/AlumniUT, send an email to alumni@utwente.nl

# MY JOB

![](_page_41_Picture_1.jpeg)

# I LEARN SOMETHING NEW EVERY DAY

Jan Berkvens has enjoyed an international career in pursuit of the most effective form of education. "I think it is important that we in the Netherlands continue to review and assess our educational processes." BY Hans van Eerden PHOTOS Gijs van Ouwerkerk

> Jan Berkvens' first job was as a zookeeper. He went on to study biology, which he taught for over ten years with much pleasure. He then sought further depth by studying Education Science in Leiden. "I decided it was time to expand my horizons abroad. I felt a moral obligation to share my knowledge with people who are less fortunate in life." As a volunteer for UNICEF, he was assigned to the Ministry of Education in Cambodia. Although Cambodia embraced the UN Millennium Objective of 'Education for All', the country had been torn apart by civil war and lacked the necessary infrastructure.

"I felt a moral obligation to share my knowledge with people who are less fortunate."

### Capacity

Jan produced a capacity development plan which would entail training ministry staff, those at district level and teachers in schools. "It was almost a question of starting from scratch. My Cambodian colleagues and I had to reinvent the wheel. I had the theoretical knowledge, but I had to find the best approach there and then. My plan for 2009-2012 was duly implemented and they still use my training handbook today."

Having returned to the Netherlands, Jan gained a doctorate at the University of Twente for his thesis on 'Professional capacity development with greater yield'. "I had learned to think about education in a broader and more cohesive way."

#### **Culture**

Jan's work came to the attention of SLO, the national centre of expertise in curriculum development. He was invited to take part in a project in Suriname which involved devising the national curriculum for primary education. There was a logical connection with his work in Cambodia, but there was also an unexpected stumbling block. "In Cambodia, they speak a different language. I had time to think about exactly what I wanted to say and how. In Suriname, they speak Dutch. Communication was that much quicker but there were still marked cultural differences to be overcome."

In 2012, Jan Berkvens returned to take up a position with SLO in Enschede. "I had been away for six years. My knowledge and skills were no longer up-to-date. Even now, I am still learning something new every day, which is necessary if I am to play my part in ensuring that all the world's children have access to good education."

#### **Perspective**

Jan's international experience helps him to view education in perspective. We need not be envious of countries such as Singapore and South Korea, he contends. "Children there spend all day in the classroom. When they come home, they are given private tuition. Very little attention is given to socialization. These children do not have a rounded upbringing. By comparison, education in the Netherlands has many good features, such as the sheer dedication of teachers, good classroom resources and excellent school buildings. Nevertheless, I think that we should continue to reassess our education system and methods to identify areas for improvement."

# A LOOK Ahead

THE UNIVERSITY OF TWENTE is a modern, enterprising research university. We work to develop the technologies that will define our future, whether in ICT, biotechnology or nanotechnology. In many areas we are already acknowledged world leaders.

We approach new technology in the context of its relevance, applying insights from the social sciences and management disciplines. The combination of 'high-tech' and 'human touch' is extremely important to us. We are known for a design-led approach which addresses the needs of the private sector, and for the creation of new, innovative companies. We work on groundbreaking solutions to the major societal issues of the day, such as energy scarcity, sustainability, safety and security, and health.

The University of Twente has 3,200 staff, 10,000 students, a network of 34,000 alumni, as well as over 700 spin-off companies.

#### COLOFON

University of Twente is the magazine for alumni and partners of the University of Twente.

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![](_page_42_Picture_24.jpeg)

# DAAN ROOSEGAARDE: THE 'HAPPY INFILTRATOR'

He challenges traditional ideas about design, art and technology. His approach is that of the 'happy infiltrator', proposing new solutions with a poetic slant.

Daan Roosegaarde studied at AKI, Enschede's art and design academy. He and his studio team design remarkable, interactive artworks such as Dune, a landscape of LEDs which responds to touch and movement. His mesmeric Lotus Dome, which also interacts with passers-by, was exhibited at Amsterdam's Rijksmuseum for several months. But Roosegaarde is not 'just' an artist. He wants to

tackle major issues such as pollution. He proposes 'vacuuming up' the smog of Beijing and converting the carbon particles into precious stones: from noxious fumes to designer jewellery. He is also working on the concept of 'smart highways' on which the painted lines light up at night. In a 2013 television interview, Daan Roosegaarde described himself as 'a hippy with a business plan', a member of a new generation which exchanges ideas at lightning speed and will not allow them to be rejected out of hand. Roosegaarde will speak at the Opening of the Academic Year 2014-2015.

# AGENDA

1 September 2014 Opening of the Academic Year

17 September 2014 Prinsjesdag Symposium (PLD)

22 September 2014 MESA+ Meeting 2014

#### 26 September 2014 Startup weekend Enschede (Powered by Twente)

4 October 2014 Open House and Donors Day

#### 4 October 2014

Lecture by AI Gore, former Vice President of the United States, at the Junior Chamber International annual conference

28 November 2014 Dies Natalis (Founder's Day)

For further information, go to: www.utwente.nl/evenementer

# **SPIN-OFF**

# **A QUIETER ROAD SURFACE**

BY Hans van Eerden PHOTOS Kees Bennema

Traffic noise is a source of nuisance for those who live close to main roads. The authorities often attempt to reduce the problem using noise baffles or 'silent asphalt'. "And then, out of nowhere, a Twente researcher comes up with an ingenious and relatively inexpensive alternative," states Eric de Vries, CEO of the company 4Silence. "Simply lay grooved concrete blocks along the side of the road and traffic noise is reduced at a stroke. Our idea has prompted much interest."

Ysbrant Wijnant (who graduated in 1994 and gained his doctorate in 1998) discovered a phenomenon whereby sound waves travel along and within grooves in the concrete, where they combine and are amplified. The resulting resonance moves directly upwards, taking the sound waves of the traffic with it. The noise at ground level is reduced by some fifty per cent.

Wijnant approached Kennispark Twente, whose business consultants contacted Eric de Vries, then involved in road design and construction. He advised against taking the idea to an existing company, recommending that Wijnant should set up his own business and approach public sector authorities directly. In late 2012, De Vries was invited to head the new spin-off and 4Silence was launched. The first step was to undertake lab tests, computer simulations and field tests in order to optimize the effectiveness and safety of the system, and to fine-tune the design to facilitate production. The end product, named Whisstone, is now ready for final testing.

Twente Technology Fund provided the necessary financing, while business accommodation was offered by Kennispark Twente in the new Gallery innovation centre. "It is an excellent location which emphasizes our close collaboration with the university. That opens many doors in government circles: local authorities, provincial authorities, and the national department of transport and public works. We foresee growth very soon."

www.4silence.nl

![](_page_43_Picture_8.jpeg)

# **UNIVERSITY OF TWENTE.**