

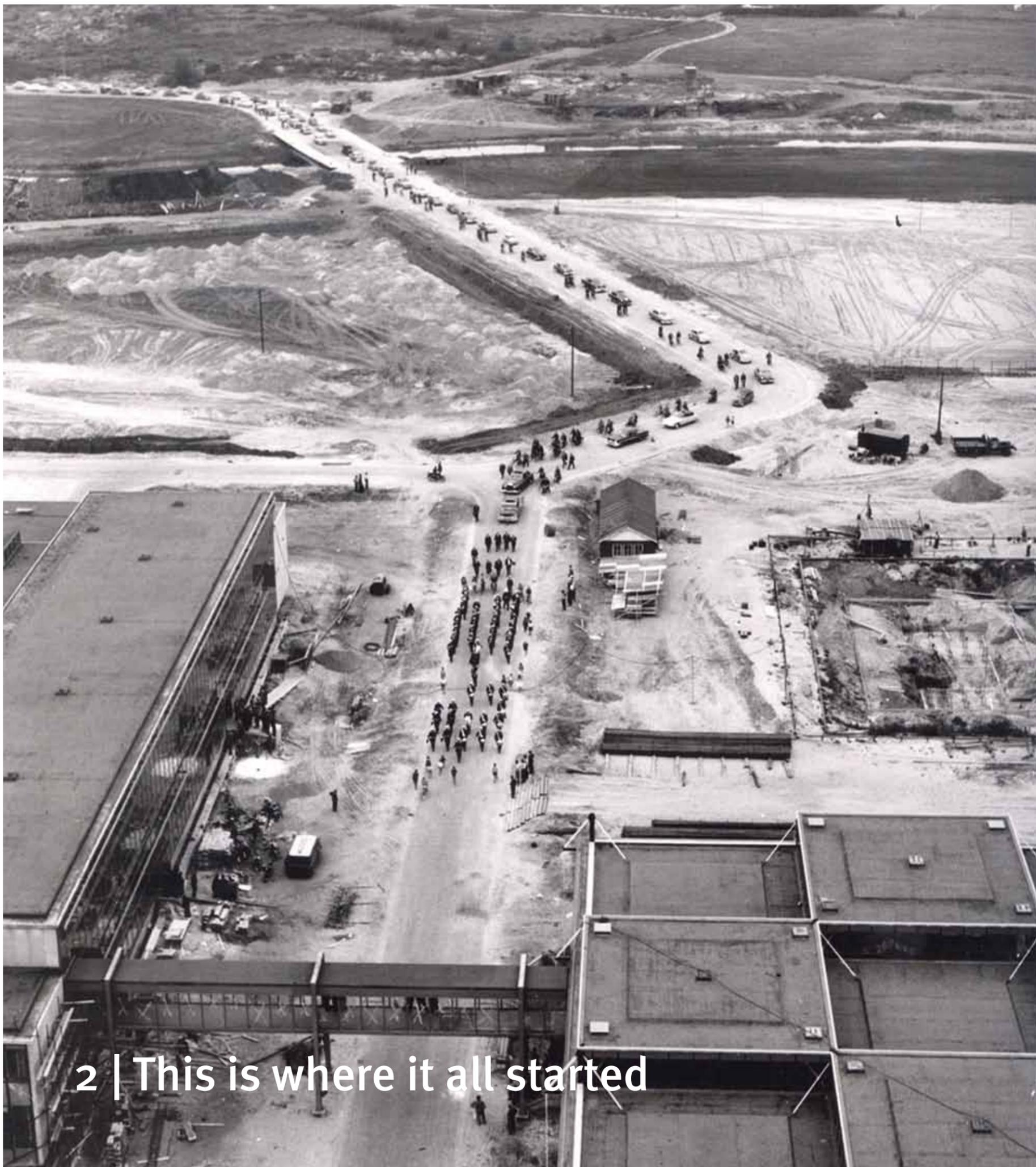
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Cursor

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2 | This is where it all started

3 | Are business taking over universities?

4 | Fled from Syria

5 | Dutch Technology Week

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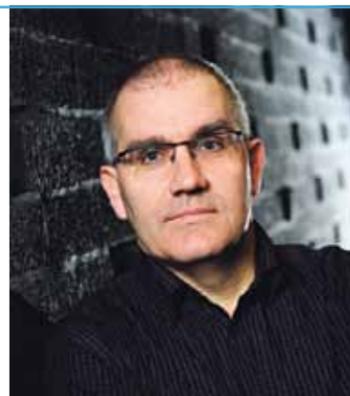
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Follow the money

Exempt science programs from tuition fees. It's the brilliant idea PvdA came up with to win votes of potential and current science students, and possibly their parents, since it will save them a substantial chunk of their housekeeping budget. CDA's Henk Bleker was already dangling part of the carrot in early May. Bleker intends to lower tuition fees for science students considerably. Let's sit and wait for the party who'll offer students money in exchange for

a science degree. Going once... Assuming it takes seven years to graduate, and seeing a fine for delayed graduation won't be implemented after all, a science student will be saving a total of 12,397 euro, all thanks to PvdA. And that's without taking into account an expected increase of tuition fees, so let's say they'll be saving some twenty grand. Not bad for a down payment on your starter home, which will have a much smaller price tag in 2020 as well, I'm sure. So is this financial paradise for our future engineers? True, they don't invest as much in 'themselves' as do future accountants or lawyers, but those fellows beat any one engineer when it comes to salary seven years later. They'll have recovered those twenty grand in barely two years. So I think the question Dutch politics should be asking itself is this one: How do we make sure science students are at least comparably remunerated for choosing a science program?

A party for the book

In certain areas of expertise, nano-electronics for example, one might just get involved in a technological breakthrough that turns the multi-billion-dollar industry upside down. Usually, however, it's not until later people conclude they've actually changed the world. On the other hand, whether or not something is scientifically relevant is often clear right off the bat. A publication in a renowned periodical is a good way of telling - and is often regarded as the one factor for success. So a party was in order after Physics of Nanostructures was published in Nature Communications. Now only time will tell



if their findings will make it into the history books.
Check page 8

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◀ Rewwwind www.tue.nl/cursor

PvdA: "Science programs should be free"

29 May 2012 - PvdA wants to exempt science students from paying tuition fees. Financial spokesperson Ronald Plasterk said so in the TV program Buitenhof last Sunday. The party hopes to double the number of science students that way.

Plasterk isn't the first who's been arguing for free science studies in this election campaign. In the running towards becoming CDA's new party leader, Henk Bleker also presented a plan to "substantially" lower tuition fees for science students.

Two days of classical music on the Dommel

29 May 2012 - Eleven hours of non-stop free classical music on the waterfront in Eindhoven's city center: Saturday, June 2 will see the third edition of the Music on the Dommel festival. And it doesn't stop there,

because the party will continue on June 3, including a grand finale by Het Brabant Orkest (the Brabant orchestra).

www.muziekopeddommel.nl

≡ Clmn Grades vs. Credits



It is important to graduate with the highest possible grades because they indicate academic performance and reflect the student's capabilities. It's also important to amass credits and graduate in time because prolonged studies lead to extra tuition fees. So what's more important: grades or credits? Each student adopts their own attitude depending on their country of origin. Students outside the EEA have to pay higher tuition fees and are not allowed to work, so they tend to focus on credits and ignore higher grades in order to finish in time. Students from within the EEA are allowed to work and can receive grants from the Dutch government, due to which they are more flexible. However, they are

still aliens here, so they're not generally supported by their families in daily life and have limited employment opportunities because of a limited command of the Dutch language. As a result, they usually both study longer and pay less attention to grades. The best conditions are provided to domestic students because they aren't held back

by limitations as much as the other two groups. It so happens that meeting a relaxed, slow student with a part-time bartending job and meeting an ambitious student with outstanding grades focused only on study are equally probable among the Dutch student community.

I never thought about this classification before I started job hunting. I found out that many recruiters request a list of grades as part of the application. I am curious whether or not they take into account the time it took the former student to graduate. If so, then what's more important: accumulating grades or accumulating credits? Indeed, applying for a job leaves more questions than answers.

Sultan Imangaliyev, from Kazakhstan, is a student of Systems & Control, Department of Mechanical Engineering

◀ Flashback

Campus 1960 versus 2012

The roof of W-hal (now metaForum), Matrix (former FT-hal) and the gangway in between have remained the same, but everything else has changed. The Hoofdgebouw, Vertigo, artworks KOE and Objet Mathématique, tall trees; TU/e campus has really filled up over the years. The picture from 1960 was taken on the first day of the new academic year, the same day the Vestdijk Tunnel railway underpass was officially opened. There's a marching band followed by a parade of cars and pedestrians on their way to 'Technische Hogeschool Eindhoven'. Upon closer inspection, you might notice the absence of the apartment buildings at Montgomerylaan - what you see is a part of Oud-Woensel that's all but disappeared. By the way, there's another similarity: the stretch of sand in the center of the pictures. In 1960, the Hoofdgebouw was being constructed, and today they're working on the Green Strip. (NS)



Photo | IEC Archive



Photo | Bart van Overbeeke

Prof.dr. Arjan van Weele, NEVI chair of Purchasing and Supply Management, Department of IE&IS

Are businesses starting to control university?

Last week, chemical company DSM announced their investment of one hundred million euro in new research into biomaterials and biomedical products. And before that, chip producer NXP and the Association of the Dutch Chemical Industry (VNCI) announced their plans to award grants to future Master students. Although universities have managed to keep businesses at bay for a long time, collaborations seem to be increasing in this time of economic uncertainty. Is it important for universities to collaborate with businesses and industries? What are possible risks of such 'collaborations' and are there any guidelines for proper knowledge valorization?

"I'm very much in favor of collaboration between universities and businesses", says Arjan van Weele, full professor of Innovation Technology Entrepreneurship & Marketing at the Department of IE&IS, over the phone. He's on his way to a

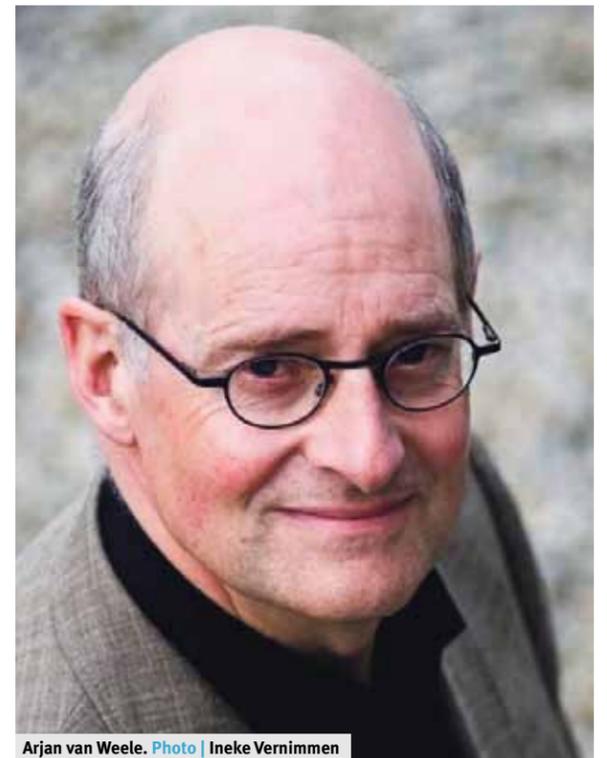
meeting of the Dutch Association for Supply Management (NEVI), which finances half of his chair at TU/e. "I understand people worrying about 'practice taking over our research' and 'there goes all independent research', but that's a typical case of cold feet. This fear is fueled mostly by pharmaceutical research, which businesses have coordinated poorly in the past. Sometimes negative results were disguised or research setups were changed for the sake of a better outcome. But in the field of technology especially, I've hardly ever seen things go awry. One should always be careful, of course, but that fear shouldn't have the upper hand."

"There are already many departments collaborating with the industry, often more specialized majors training for people for business life anyway. Apart from that, for some social problems there's no choice but to collaborate. Physicists have their experimental

setups, but for some studies, theories can only be tested in practice. Over the course of the years, more and more departments have been forced to look for interested parties from the industry. Because of governmental cuts, there's ever less money for academic research, so people have to look for other ways to save their research financially. Research groups that have always been fully financed by the government still tend to hold on to a fairly elitist attitude - 'my research is too good for company meddling'. You can keep persisting, of course, but in the end it will only be detrimental to the research project. As a professor, it's best to go along with the opportunities that are presented. It's no surprise that some professors are embarrassed to peddle their work. Acquisition isn't easy. It's not a matter of taking a quick course; you really have to learn the hard way." "It's important to always conduct independent research. But don't be

mistaken: companies value independent research as well, so there's no clash there, necessarily. However, businesses do demand applicability. Not all academic research has to be fundamental, there's nothing wrong with applied research. In fact, I dare say applied research is the future. Western Europe will be in crisis for a good number of years, the only economies that show a slight growth are those of Asia and South America. As far as research grants go, we shouldn't expect too much from the

government right now, since grants are just not that important right now. Try and apply your research in practice, show your face at conferences, write articles from a practical point of view. Eventually, the industry must come to recognize you as an expert, because that means you're on the right track. I've been working with companies for years myself, and I still do so right now. All I can say is this: it's made me into a hands-on kind of person." (NT)



Arjan van Weele. Photo | Ineke Vernimmen

The heart of Catalyst

Since April 1 of this year, several companies have moved into Catalyst.

It's currently accommodating some 10 companies.

The building has room for 30 to 35 techno-starters.

Catalyst's developers want the building to be fully rented out within 5 years.

But that's expected to happen within 3 or 4 years already.

The construction of Catalyst took about 1 year. The official opening is scheduled for late August or early September. (HR)

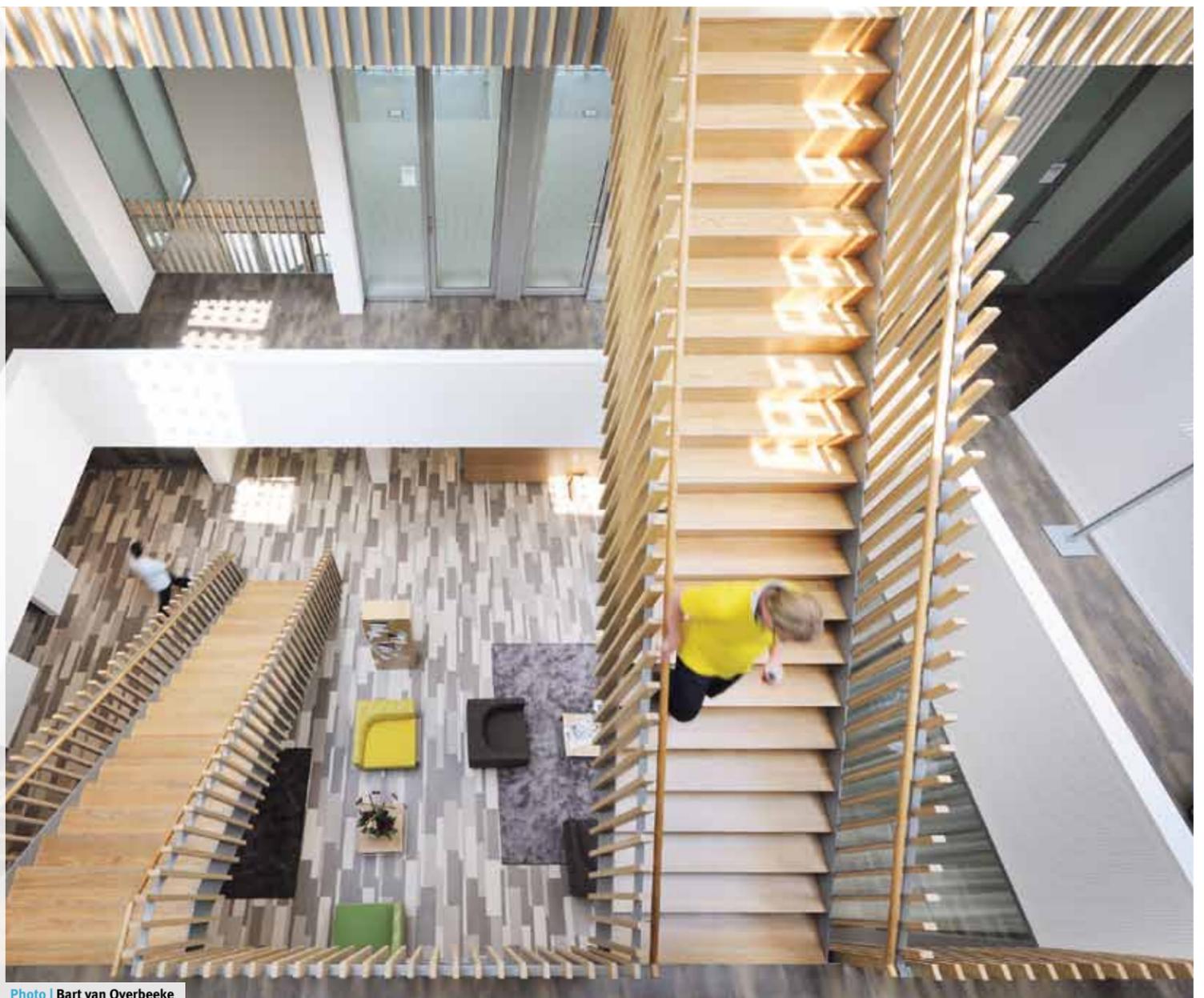


Photo | Bart van Overbeeke

Gaby Abdalla | “Not better or worse, just different”



He calls it the biggest step in his life. More than eleven years ago Gaby Abdalla (36), then a newly graduated student of Architecture, was forced to flee from Syria. In the Netherlands he tried to build up a new existence. And succeeded. For although he had to redo his study almost from scratch, he will obtain a doctorate for sustainable house building on Monday 18 June.

As the political situation in Syria is quite sensitive at present, Gaby does not want to go into details about his flight. “Having to leave everything behind you without any idea where you will end up is not something you do lightly. After a long journey together with my two little brothers, my sister and mother I arrived in the Netherlands, looking for a safe haven. I knew who Van Gogh and Rembrandt were and I knew the Dutch football team. That was about it. Although we were treated very civilly by the IND, that initial period was one great shock nevertheless: a language you don't know, an unfamiliar environment, the uncertainty whether you can stay or not. We really supported each other as a family and my mother in particular played a very important role. She kept hammering on the importance of

learning Dutch, traveling one hour on the bus every week to go to her language lesson. Never say die, that's her motto. She impressed on me that I was successful in Syria, so why shouldn't I be able to be successful in the new country too? Even before the residence permit had been arranged, I started studying again; I can't sit still anyway.” Which is also obvious from Gaby's doctoral period. In the past five years -apart from his scientific activities- he got married, got two children, has been a committee member in the Syrian-orthodox religious community St. Jacob d'Sroug where he holds a number of important portfolios, and on top of that he manages to pull his weight in the vegetable garden, to play basketball and to meet friends frequently for a night out and dinner, a Syrian meal or just a Dutch mashed pot. And he sings a lot, even though he has a rotten voice -as he says himself. Still, doing the very things that you enjoy makes it possible to forget the heavy burdens of life for a moment, says Gaby. Besides: if you keep doing the same thing over and over again, you easily get bored. Hence the great variety. He has managed to get his life in the Netherlands on the right track again,

he thinks, although this was by no means easy. “Thanks to the grant from the refugee students' foundation, UAF, it was possible for me to start a study. Constructive design -in which I graduated in Syria - seemed less of a challenge to me in the Netherlands, so I decided on another field of study focused on management. The hospitality and assistance I got from fellow students and supervisors at TU/e felt like a warm blanket. I was quite uncertain, didn't know the language well enough yet and was in the middle of my integration process. Also, I had to travel between Enschede and Eindhoven every day, where my age and descent made it hard to find a room. The pleasant study environment made the daily trip more than worth it, though. When I graduated from TU/e five years ago, I looked at my future once more, very realistically. I knew that I needed more baggage than my fellow students to get a good job; because of my descent and the fact that my Dutch was not fluent yet. So when professor Ger Maas offered me a doctorate project about sustainable house building I grabbed the opportunity with both hands. Especially because sustainability was getting more and more public attention, when Al Gore's

film had just been released. I spent several days every week at BAM Techniek in Apeldoorn, where I gathered the necessary knowledge about sustainable technical installation concepts and found out how sustainable building really is. You may come up with millions of very nice ideas behind your desk, but they have to work in practice. Together with TU/e professor Cees Midden, a psychologist, we also examined the interaction between sustainable installation systems and the occupants themselves. The result was surprising: it turned out that we design not from the perspective of the occupants, but we first look at profit and the aspect of sustainability. You shouldn't impose a certain lifestyle on people, for that won't work. Sustainable technology should be designed so as to allow it to be used sustainably by the occupants. In my present job at BAM I am now trying to put that into practice more.” Although he always enjoyed coming to Eindhoven, Gaby is pleased that his new job, in Apeldoorn, is closer to his home. For he would hate having to move from Enschede. “In and around Enschede there is a large Syrian community, people who share the same roots and

who have experienced the same things when they fled. That makes life easier; it is good to talk to them about the past and the future. I'm deeply concerned when I look at Syria. I'm hearing many stories from relatives and acquaintances there and I see the pictures on Facebook. It's horrible. Of course I hope that there will be a solution very soon, but I don't see that taking place before long. If I should ever go back, it will be as a visitor, to show our children the land of their parents. I lost six years of my life due to my flight, and I don't want to lose still more time by having to build up a new existence again. My future is here now. It is not for nothing that our son is called Christian Issa - a beautiful Dutch name combined with my father's Syrian name. The Netherlands is a good country to live. I find it difficult to compare this with my earlier life in Syria. It's not better or worse, it's just different. But I am proud of the Netherlands. Many people's open attitude, the social climate. And the Dutch football team, of course - my orange outfit is already waiting for me.”

Interview | Nicole Testerink
Photo | Gijs van Ouwkerk

Dutch Technology Week: numerous events around technique and technology

And this is why Brainport Eindhoven is the smartest...

Showing the hidden treasures of Brainport Eindhoven to the outside world. That is the idea behind the first Dutch Technology Week (DTW), to be held from June 1 thru 8 in and around Eindhoven.

Companies and knowledge institutes are joining forces to submerge visitors in the fascinating world of technique and technology. TU/e is contributing to this event in many ways.

TU/e students in the running for best idea of Eindhoven

The BRAINS Award is a contest in which students come up with ideas to make life for the inhabitants of Eindhoven pleasanter. Of course TU/e is represented among the finalists with a number of innovative plans.

A likely candidate for the Award is the C-Shirt of students Dirk Adriaanse (the Built Environment), Rob Engels (Industrial Design) and Paul Helgers (Applied Physics). During an Entrepreneurship minor they developed the plan for a shirt that monitors the health of elderly people 24 hours per day, Paul explains. "The undershirt is equipped with electronics that measures heartbeat, temperature and respiration. When there is anything amiss, a relative or doctor is alerted. We have also built in GPS to find the location of a demented patient, for instance."

A benefit over existing alarm systems is that the shirt gives the elderly a great sense of security. Paul: "The elderly patient knows that the electronics is

monitoring their health continuously." Another bonus is that the shirt provides useful information about vital bodily functions to a doctor, which is something demented people themselves can often not do anymore. Also, whoever wears the shirt does not need to press a button themselves anymore in case of calamities: the shirt will warn automatically when there is something wrong. Even if the wearer is unconscious.

On Thursday June 7 the twenty finalists of the BRAINS Award will present their findings and the winners will be announced.

The twenty finalists stand a chance of winning one of the five prizes. In addition to the BRAINS Award, the livability prize (of Eindhoven's Town Council), the De Lage Landen-sustainability prize and the public award will be presented. The total prize money is twenty thousand euro.

www.brainseindhoven.nl



The C-Shirt monitors various bodily functions of the wearer.

Academic annual prizes show the proximity of new technology

Open to the general public this year for the first time: the academic annual prizes. These prizes are awarded for the best Final Project Award, the best Design Report and the best Doctoral Project at TU/e. One criterion is that the research should contribute to the valorization of academic knowledge.

TU/e opens the ceremony of the annual prizes to the general public so as to show the bee's knees of its research to as many people as possible.

Moreover, TU/e wants to make it more visible that a great deal of research is strongly anchored in major societal issues of today, whereby collaboration

with the business community is of crucial importance. It is these research projects with companies that make the Brainport what it is: the smartest region of the world.

Visitors are welcome to the official part, in which the prizes will be awarded and the winners will explain their research briefly in short speeches. After this they can go to the congratulatory reception and a photo exhibition whose theme is science.

The prizes will be awarded on Thursday June 7 as of 16.00 hours in the Blauwe Zaal of the Auditorium.

Technology in Harry Potter as guideline for designers

It is rather a rare event at TU/e: father and son together besieging science. Prof.dr.ir. Berry Eggen and BSc. Daan Eggen will present a lecture about magic objects in the Harry Potter stories. They will begin at the opening of the Dutch Technology Week, and will subsequently push on to the first international scientific Harry Potter conference in Ireland.



These two worlds, totally different on the face of it, have come together for many years at the kitchen table of the Eggen family in Eindhoven. The father contributes his knowledge and experience as a researcher in the business community and at the university in the field of intelligent systems. The son is a fanatic devotee of the fantasy genre, Harry Potter in particular. In the course of their conversations the two worlds approached each other more and more. Whereas modern science is used as a gatekeeper between reality and magic, at this kitchen table it was the fantasy world of J.K. Rowling, the writer of Harry Potter, which increasingly became the guideline for the design of technology in our reality.

Have you lost me? In Harry Potter we see countless magic objects passing by. Like

a cloak that makes the wearer invisible and a clock that tells where next of kin are staying and whether they are in danger. This excites the imagination of many people: suppose this were true one day... When a great deal is already possible indeed, says Daan. "Microsoft is making that clock at this moment." So it is not the technology, still inconceivable at present, which makes these objects so special. Time will ensure that the magic of today will be reality tomorrow. It is the very power of the design of the magic objects that makes them so good. Which is precisely what inspired father and son to reflect on why the designs are so good.

Berry: "The first challenge for a designer is that a product should engender an experience. You experience something, when in the past all that mattered was the functionality. Take the invisibility cloak. It kindles the imagination because it allows you to experience very exciting things. Everybody has an immediate fantasy as a result. Designing for experience is the first and foremost challenge in this day and age." Daan: "It means that designers should not go and design technology, but an environment that enables us to have an experience. The imagination should be the point of departure here, not the available technology."

Other challenges for designers, and more about the fertile relation between fantasy and technology, can be heard at the lecture by Berry and Daan Eggen at Smart meets Smart, the kickoff of the Dutch Technology Week - Friday June 1, 13.00 hours, hotel Cocagne, Vestdijk 47 in Eindhoven.

Special speakers during this event are Nobel Prize winners Gerard 't Hooft (Physics) and Dan Shechtman (Chemistry). TU/e compiled the program.

TU/eXperience tempts visitors to discover technology

A highlight in the Dutch Technology Week is the TU/eXperience, a day when young and old can get acquainted with the university, especially with the societal challenges in the strategic areas Energy, Smart Mobility and Health.

By means of numerous activities, many of which involve an active role for the visitors themselves, the university wants to show the public and allow the public to experience how much fun technology is and how it may contribute to a better life. Think of technological solutions for less congestion, cleaner engines, faster discovery of diseases, getting better without surgery inside the body and applications that allow elderly people to live in their own homes longer. It is hoped that many young visitors will be enticed to start a study in technology.

The activities will take place in the Auditorium, Hoofdgebouw, Potentiaal, Impuls and the grounds outside. Examples of crowd pullers are the sustainable fleet with energy-efficient and smart cars; a circuit for dodgem cars; the race car and the football robots. The Tesla Coil, which people may know from the festival Glow, will also be on show. It is a transformer that can generate high tension.



Photo | Bart van Overbeeke



Photo | Bram Berkien



Photo | Peter Peels



Photo | Bart van Overbeeke

The TU/eXperience will take place on Sunday June 3 from 12.00 - 17.00 hours. www.tue.nl/tuexperience

A grip on information trains

In magnetic racetrack memories, data encoded in magnetic domains is transported rapidly and efficiently to the computer processor. Researchers of Physics of Nanostructures have recently succeeded in manipulating the transfer of these magnetic bits by means of electric fields. Last week this energy-efficient breakthrough was published on the site of Nature Communications.

Electric storage media such as Flash are becoming more and more important for the storage of data. Nevertheless, experts expect that this advance will one day come to a standstill because each electric bit is inevitably connected with a -relatively large and costly- transistor.

The speed limit is several hundred meters per second

For this reason, magnetic storage provides better opportunities in the long run for the cheap storage of large quantities of data. Today's magnetic hard disks are relatively slow and vulnerable, though, because the data is written and read by moving read and write heads.

In 2002 prof. dr. Stuart Parkin, distinguished professor of TU/e,

therefore suggested developing a method of magnetic storage without any moving components. In magnetic racetrack memories the magnetic bits -so-called domains, areas with a certain magnetic polarization- move to and fro through nanowires along a read-only and write station in the processor. In Parkin's variant of the racetrack an electric current 'pushes' the data flow through the wire. The information is the only thing flowing: the magnetized atoms in which the information is stored remain firmly in their place. Despite this, the drive with an electric current costs energy due to the development of heat (dissipation). "Moreover, by using this method you influence all the bits in the wire, so that you cannot control the individual domains", says doctoral candidate ir. Sjors Schellekens, the first author of the article in Nature Communications.

By laying out electric fields along the

wire it is possible to adjust the propagation speed of the domains locally. That is: if the magnetic domains are sensitive to those electric fields, which in most cases they are not. Schellekens: "Scientists have long surmised that ferromagnetic materials, including the domains, are not sensitive to electric fields. These fields bring about the accumulation of an electric charge in the outermost atomic layer of the magnetic material. Normally this does not have a measurable effect on the properties. However, we have made the magnetic layer so thin, with a thickness of merely a few atomic layers, that the magnetic properties change significantly. For as much as half of the material is located on the surface then. This causes the so-called bulk properties of the material, which usually determine the behavior, to dwindle into the background."

By varying the strength of the electric field, the physicists have succeeded in changing the propagation speed of the magnetic bits more than tenfold. "Indeed, computations indicate that the effect may become many times greater yet", says Schellekens. The speed limit for the bits is several hundred meters per second. To investigate the electric effect, the researchers did not make use of a genuine nanowire, but of a thin

magnetic film. This is less than one nanometer thick, but a few hundred micrometers broad – big enough to allow the movement of the magnetic domain walls to be followed under a microscope. This tape is still hardly discernible with the naked eye. "For us this may be macroscopic, but if you place a hair next to it, you can see that it is really very minute", says prof.

The bits are moving like trains on a model railway

dr. Bert Koopmans, who carries the final responsibility for the research as group leader. "However, the fundamental physics in this tape is similar to those in a nanowire."

Koopmans compares the racetrack with a model railway. A moving magnetic domain -a bit- corresponds to a train on the railway. "On an electrically operated railway all trains move equally fast. You can try to enhance the resistance of the rails locally, so that a certain train will come to a standstill on that spot. Then it will take extra energy to get the train moving again, however. We are doing this in a far more ingenious way: our electric fields

make it possible for us to switch off the excitation of the rails locally, as it were. This allows us not only to manipulate the bits separately, but also to make them continue their journey without any loss of energy."

The Eindhoven invention adds a new component to the toolbox of researchers in their area of expertise, spintronics. Although racetrack memories will not hit the market within the next decade, in the long run their discovery may have a considerable impact on consumers and society, Koopmans expects. He anticipates applications especially in so-called autonomous devices: chips with sensors in consumer articles, or minuscule devices conducting measurements on or inside the human body which should consequently require very little energy. "This energy-efficient manner of manipulating bits with electric fields could accelerate the development of autonomous electronics. Still, it always remains difficult to predict successful applications. In many cases, you can only smile when remembering those predictions later, when the real success has come from a totally unexpected direction." (T)

