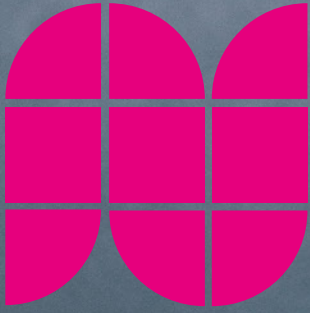


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Pulse. Magazine

#2 - 2023

This is the future of Health & High Tech

MARC VAN RANST

*His battle against
fake news*

PAVING THE WAY

*The next generation
celebrates diversity*

PROMISING 9

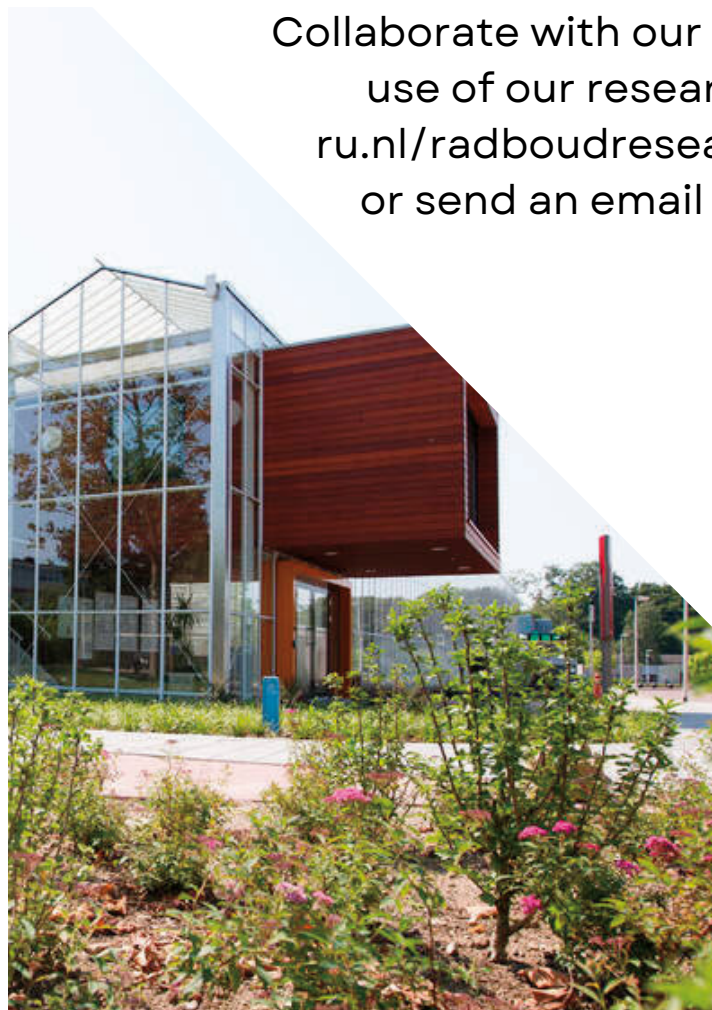
*Keep an eye on
these startups*



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Editorial office

Joey van Baarsel (Editor in Chief,
Noviotech Campus), Joost Heessels
(Magenta Communicatie), Alon Winnen
(Letterdesk), Pieter Lomans.

Design

Hilmer Thijs (Hands Creative Agency)

Images

Elske Nissen Fotografie, Barbara Kerkhof,
Fotowerkt and partners and interviewees.

Production support & distribution

Joost Heessels (Magenta Communicatie)

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Contact

Transistorweg 7-N
6534 AT Nijmegen
The Netherlands
+31 (0) 24 204 90 60
pulse@noviotechcampus.com
www.noviotechcampus.com

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PREFACE

Pulse. Magazine

#2: The Elephant in the Room

Some things are so obvious that you just look right past them. A feeling you've been struggling with, a problem you wish would just disappear, or something you've been looking for, which turns out to be right in front of you all along.

Our world is changing. Who still flies without embarrassment, thinking about the environmental impact of our holidays? Our climate is changing. The weather is becoming more unpredictable and unstable, with northern Europe experiencing Mediterranean summers and super storms coming out of nowhere. Meanwhile, politicians face one crisis after another, not knowing how to deal with a faltering economy and labour market shortages. Not to mention dilemmas such as 'Who is in charge of social media?' 'Who controls and verifies our information?' As Belgian virologist Marc van Ranst found out for himself, things can get pretty ugly if we don't. We are changing.

Meanwhile, change can be scary. So, a natural response could be to go on, keep things as they were, to do things as we have always done. But that no longer serves us. If anything, it's working against us. As Bertine Lahuis, vice-president of the Radboudumc board puts it in her column: "Sometimes, in order to move forward, you have to take a step back and think." So, that's what we did.

And, fortunately, we found something along the way: hope. We found hope in people who want to look forward, people with fire in their bellies, who dare to see through our foggy world and clouded minds. People like Maarten Steinbuch, a true techno-optimist, who celebrates his love for technology and progress in an ode to Moore's Law. Or

Valerie van Zuijlen, who travelled the world with her dream, and didn't stop until she'd created what she was looking for: a place for startups to find each other and work together. Or people like Marc Klein Wolt, who has dedicated his life to searching for meaning all across the universe –inspiring others by connecting people (and telescopes) around the world.

Let's not forget where we've come from. We've seen crises, changes and revolutions all throughout our history. We've had the honour to have an exclusive interview with horticultural icon Piet Oudolf, one of the Dutch green revolutionists, who was willing to share with us the inspiration, hope, intelligence and above all the beauty he sees in the creation of plants, gardens and landscapes all around the world.

This issue of Pulse is a friendly reminder. A reminder of the fact that everything we need, is already here. And although it takes courage, will and time to face our obstacles, the rewards are there if we do. So, instead of looking away, let's put the finger where it hurts and take a closer look at the elephant in the room. Turns out: it's not scary at all; it's just big. And how do you eat an elephant again? That's right.

Love and trust,



– Joey van Baarsel,
Editor In Chief

“Are we asking the right questions about our future?”



As a mother of two, I see my children searching for meaning. And that's not surprising because, in our constantly evolving world, new social issues are arising every single day. If we wish to see which technological developments are helpful and necessary in healthcare, we need to clarify the fundamental questions in our society. It can be very useful to take a moment to stop and think before we move forward. We need to take responsibility and ask ourselves: What are the fundamental questions in our society?

The advent of the Comprehensive Care Agreement has created a clear agenda for healthcare. Many social issues transcend our healthcare system. On the one hand, this involves individual problems. Think about lifestyle and prevention, for example. How do we prevent sickness? How do we keep our stress levels under control? What about vaccine developments for preventing new diseases?

On the other hand, there are more extensive, collective issues. For instance, what about the accessibility and affordability of healthcare? There are huge social disparities in our society. Of course, climate issues also have large-scale implications for many sectors, including the health & high-tech sectors. After all, all of these factors can affect our health.

“Even the smallest stones can create ripples.”

As Chair of the Executive Board at one of Europe's leading healthcare and innovation institutes, I want to show people and make them believe that we can make a change. Through storytelling and the power of imagination, I'd like to take them on a journey into the change that our society needs. Through stories, we can highlight challenges, solutions and opportunities. They help us engage in conversations about important topics.

There is a major need for facts, knowledge and different perspectives. Stories about what people need or what they do, stories that people share and write together – stories that connect.

As long as our knowledge remains connected, we can inspire others. It is especially in the interests of our younger generations that we need to combine different perspectives. Every story matters! No matter if it's a small story about someone's experience or a great inspirational story about what people achieved together. We need to share different perspectives, so that our younger generations can determine their own. In our region, we do this through collaborations between hospitals, educational institutions, knowledge campuses and – above all – people. Anyone can be an inspiration to someone else; even the smallest stones can create ripples. We have a huge potential, and combining all of these sources will enable us to innovate.

“We need to share our perspectives, so that our younger generations can determine their own.”

You don't learn how to walk without falling down. You don't learn how to talk without making a slip of the tongue. This is what I try to teach my children and what I try to show them as well. Sometimes we think we have all the answers, but most of the time, we don't even know what the real question is. Acknowledging this, taking responsibility and acting upon what we've learned from it could be the first small step to paving the way for future generations. And as long as we're doing it together, we will decide how we write the story of our future.




*Bertine Lahuis
- Chair of the
Radboudumc
Executive Board*

INTERVIEW – MARC KLEIN WOLT

Shooting for the moon: the motivation and mindset of Marc Klein Wolt



IMAGES: BARBARA KERKHOF



“I believe there is or must be an explanation to everything – we are able to understand everything”

“Once I set myself a goal, I’m very dedicated and will do everything in my abilities to achieve it.” Radboud University astronomer Marc Klein Wolt boasts an impressive track record of aerospace achievements: from putting a telescope behind the moon to his involvement with the first ever picture of a black hole. How does he do it? And why? What’s pulling him towards the limits of what we know, pushing him to make the most of his potential? Before he takes off to Namibia - where he’s working on a telescope for the Event Horizon Telescope - we meet Marc at his office in the astronomy department of Nijmegen’s Radboud University, where we get a glimpse inside the mind of a rockstar scientist.

Why are you building a telescope in Namibia?

“We’re working on another telescope for the Event Horizon Telescope, where astronomers and scientists are building and connecting telescopes from all over the world to take pictures of black holes. So far, we’ve been able to take pictures of not just one, but two black holes – one in our own galaxy, the Milky Way, and one in a more distant galaxy. This is awesome, because now we have tangible proof that black holes actually exist. Not only do we have a theory or a prediction, but we have actual

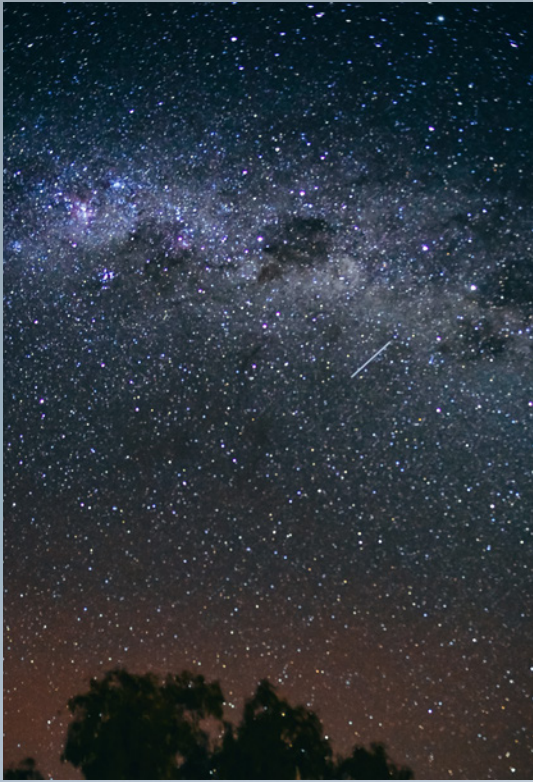
footage, we’ve got data: we have proven Einstein right. Now we want to learn more about them. In order to do so, we need more telescopes, one of which will be in Namibia.”

What do you hope to learn?

“What we’re especially interested in, and hoping to see, is how matter moves around a black hole. The images we currently have are comparable to pictures on a regular camera: they’re a snapshot, showing us what a black hole looks like at a certain point or moment in time. What we’re trying to do right now, can be compared to taking a picture with a longer shutter speed. New telescopes, like the one in Namibia, allow us to make longer observations and to integrate these pictures, maybe even into a movie. Can you imagine seeing a black hole move? These movies will help us understand the theory of black holes, better than ever before.

And why’s that so important – understanding a black hole?

“Because, the way I see it, black holes are ‘the place to be’ for physics and astronomy, maybe even for science in general. They’re one of the biggest mysteries in our universe, a place where the force of nature occurring on the largest of scales – like gravitational theory – is combined with that of the smallest – quantum mechanics. By studying black holes, we’re studying the fundamentals of our world. Through theories, like the string theory, we have an idea about the way nature works, and we can make assumptions and predictions. But



Night sky at Namibia, with clear sight of the Milky Way

we won't know if any of that is true until we have proof. We need these pictures and movies of a black hole to verify whether our theory is correct, which allows to get a better and clearer image of our world – and maybe understand ourselves a bit better, too.”

Do you think we'll eventually be able to understand everything?

“Yes, I do. Some people believe in God. I believe that there must be a logical explanation to everything. Why should we accept a limit to what we can understand or know? I want to understand everything. I want to understand why we see things the way we see them, why they work the way they do. I want to understand more about nature, physics, and the world around us. I truly believe that, if we want to fully comprehend our universe, we need to keep pushing the boundaries of our knowledge and technology. That's what science is all about to me – it's an important reason for me to do what I do.”

How do you manage – trying to understand everything for a living?

“It's all about dedication for me. I want to challenge myself, set a goal and then go for it. And once I do, I dedicate almost my life to it, and I'll do everything I can to achieve it. Achieving a goal is one of the most beautiful

things there is to me. I believe that's my sweet spot, where I feel like I'm making the most of myself and my abilities. And once I've achieved something, I'll remain involved in some way, but I also always feel like moving on to the next: to set a new goal and create something new. This way of working fulfills me with so much energy - and being able to share that energy with others is what makes it all worth to me.”

So, you're always on the go, moving from one milestone to the next, creating new things. Do you ever take a break?

“A couple of years ago, I was pretty much forced to stop. I was working in a more corporate setting and not enjoying myself, so I set myself a goal: I wanted to get into aerospace engineering and work on a mission to the moon. And then that mission actually happened and we succeeded. Not just that, because shortly after, my team was also involved in taking the first ever picture of a black hole – which is like Nobel Prize level science. So I was checking a lot of my top boxes there. This had me wondering: what's next? I had to take a moment to stop and think, not just as a professional or innovator, but also as a person: who am I and where do I want to go next?”

How did you figure that out?

“I was asked to lead a couple of big projects at the Radboud University, such as setting up their Radboud Radio Lab together with Heino Falcke, where I also got the responsibility of managing and leading a group of people. This came with a set of new challenges, like maintaining my position in the academical hierarchy or learning how to present myself and fit into the role of director – which I didn't know how to do. I sat at the table with company boards and aerospace leaders worldwide, and they saw me as the director of an important research institute, but I didn't feel like I was. It suddenly hit me that the person I thought I was, no longer matched who I was becoming or the way I appeared to the outside world.”

Who did you feel like you were?

“To be completely honest, I still felt a bit like 'Marc, the boy from Enschede.' I was always a bit of a dreamer, but never really the smartest kid in school. I had to put in a lot of work to pass my exams and make it to

the next grade. And although things started to get better in high school and I eventually developed an interest for astronomy, that mindset and some of the insecurity it came with – stayed on me. That’s why it took me a while to understand and discover that I have something to bring to the table, too.”

So, what is it that Marc Klein Wolt brings to the table?

“When I was studying astrophysics at the University of Amsterdam, I learned that I was never going to be ‘the best scientist,’ but that I do recognise what’s needed to make something work, to realise it, and then actually go through with it. I believe this also has a lot to do with my social skills: I almost naturally know how to pick the people that seem fit for the job, bring them together, motivate them and spark that fire within. That’s how I create, and I also think that is what I’m good at - and it certainly is what I love doing the most.”

What do you love about it so much?

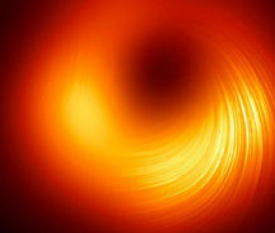
“I want to make people shine. By motivating people and empowering them to do the things they do best, you can make somebody shine. I’ve learned that, if you do so, things start to flow naturally, almost by themselves. As an example, I never have to remind anybody about any upcoming deadlines. My team is often done before we reach a deadline, because we all feel that we’re doing this together and we all have the same goal in mind. And while doing so, everybody is recognised for who they are and for their skills, they own something and feel responsible. I believe that’s where you can make the difference, and really make somebody shine.”

And what is making you shine?

“Namibia. Something about that country just got under my skin. It’s a combination of untouched, raw nature and warm-hearted and kind people – it’s truly unique. And when I’m in Namibia I can talk to children in primary schools and high schools, university students and the vice president of the country - all in the same day! Being able to do so, and witnessing the impact and meaning of our work to their community means a lot to me. We’re not just building a telescope there: we’re also supporting them in their aerospace journey and to share our love for aerospace and science with them.”

“This is truly one of the greatest gifts I’ve ever experienced, during both my career and my life. I can’t wait to go over there again next week.”

How taking a picture of a black hole works – in a nutshell



In the Event Horizon Telescope (EHT), scientists and astronomers from all over the world work together to learn more about black holes and the way they behave. From what we now know, a black hole is a position in space where the gravitational pull happens to be so strong that not even light can escape it – most likely when a star dies, it turns into a supernova and then collapses under its own gravity. Good luck taking a picture, you might say, since light is quite critical when taking a picture. However, theory predicted that a black hole should have an horizon beyond which we should be able to see the light which matter emits, just before it “falls” over the horizon and is lost forever. Through the Event Horizon Telescope, connecting multiple telescopes worldwide, scientists were already able to successfully take images of that matter for the very first time clearly showing the presence of the black hole horizon.

Would you like to dive into this matter (pun intended) just a little deeper? Ask Einstein – who already predicted the existence of black holes with his theory of general relativity – or have a look at the EHT website:

eventhorizontelescope.org

GOING GRIT

Valerie van Zuijlen: *“You have to go all in!”*

12

What is the key to success? Is it about talent, intelligence or creativity – and what about your resources, like money or a vast network? Or is it about grit: the passion and perseverance one dedicates to reaching long-term and meaningful goals? In Going Grit, we explore the stories of innovators in health & high tech. We dive into their inspirations and motivations as we try to understand their leitmotiv. Will we get a glimpse of their grit factor? This edition: Valerie van Zuijlen, founder of creative innovation hub Labnest in Ede, the Netherlands.

Valerie completed several studies, ranging from graphic design to computer science and electrical engineering to film science. To do so, she travelled the world: from Amsterdam to New York and Stanford. “After completing multiple masters, I thought, what’s next? I met a lot of entrepreneurs during my time in the United States. Back then, I already wondered what it would be like to create a place where so many amazing ideas could come together, to work on them with like-minded, young entrepreneurs.”

To bring together the world of science, technology and creativity, Valerie founded Labnest. Labnest is an innovation lab with an accelerator program for pre-stage starters. At Labnest, they believe in the power of innovative start-ups that want to change the world.

Valerie

“A start-up takes more than just a good idea. I met so many young and talented people, and so many of them didn’t know what to do, just like me.” That’s when she realised that a start-up takes more than just a good idea. “The funny thing is, Labnest is also still a start-up. I went through the same journey as the start-ups we are now mentoring. You need legal advice, strategic thinking, marketing branding, business coaches, prototyping, and the list goes on. That’s why I founded Labnest two years ago in Ede. We started with four start-ups, and they went from idea to business within nine months. After the summer, we will begin the journey of three new start-ups.”

“A START-UP TAKES MORE THAN JUST A GOOD IDEA.”

One of the goals is to give people an idea of how to successfully start a company. “We want to be a stepping stone. We try to find partnerships and let new companies cooperate. I’ve had some meetings with the government to make the Netherlands a better place for start-ups. Funding is the biggest issue, and we try to make that happen by making it more regular and accessible. From our offices in Ede, we try to find companies or people that want to invest in these start-ups.”

“I WENT THROUGH THE SAME JOURNEY AS THE START-UPS WE ARE MENTORING NOW.”

Never give up

Valerie believes that if you really want something, you should go for it. You shouldn’t give up! “Even if you’ve heard a thousand no’s, you might get a yes next time. It’s like a rush of adrenaline when it works out.”

Another thing that immensely inspires Valerie is being surrounded by start-ups. “Everyone is trying to help each other with their network. You know exactly what the others are dealing with. You need the drive of wanting to succeed. You need to be all in. Whenever you are successful, it gives you the energy to keep going.”

Valerie adds that knowing what you want to achieve is essential. A long-term and a short-term goal. And both goals need to be adjusted occasionally. “A period like the summer gives me some perspective of what I want and need for my personal goals and my start-up Labnest. These are two separate things, but I need to make sure I maintain my focus on both goals.”

Don’t be afraid

Valerie says a helicopter view is very important for a start-up. “A lot is happening: ideas, strategies, maintaining your network and socials, financial and legal issues, and so on. You’ve got to keep up with everything, but you also need to be able to see what’s important and what’s less important. Focus is key! To keep that focus, you need to look at it from a distance.”

As a start-up, Labnest too gets feedback from other start-ups. Valerie’s advice: “Listen closely and use feedback like that.” And finally, she has a tip: “Don’t be afraid and start your start-up! Dare to be brave. It might look scary, but we need changemakers. We can make a difference!”



DIVERSITY IN HEALTH AND HIGH TECH

Paving the way



More and more, diversity finds its way into the health & high tech industries. Women are raising their voice, inspiring others to pursue a career in health and high tech – and an increasing group of internationals embraces the advantages of working and living abroad. We reached out to learn from their experiences - both the fun parts and downsides - and their advice and best practices for future talent.



“The tech world can become a woman’s world, if we just enter it.”

Francesca Chiappini

As Program Manager at Chip Integration Technology Center (CITC), Francesca is responsible for communication between the research team and their clients.

The place to stay

Italian-born Francesca first came to the Netherlands as an Erasmus student. “At Radboud University, I met like-minded international students, who all intended to make the best of their time in Nijmegen. I loved the university and the physics courses, but most of all, I loved the people. International students have the same mindset, so making friends was easy. At the end of our semester, my friends went back to their home countries. But I turned my project into a PhD position and decided to stay.”

“I didn’t grow up thinking my future was in the electronics sector, but I am glad it turned out this way!”

“My PhD work was highly fundamental, and I wanted more than writing a thesis: I wanted to make an impact.” After obtaining her PhD, Francesca started a TNO traineeship, where she worked as a scientist on flexible electronics and tried out different departments. Here, she tried to make an impact, one innovation at a time.

Letting go of control

“I didn’t grow up thinking my future was in the electronics sector, but I always loved natural sciences and physics, with a slight philosophical touch. So, when I was offered an opportunity at CITC, I didn’t have to think long and grabbed it. CITC is a non-profit, joint innovation centre that focuses on better, smarter and cheaper ways to manufacture chip housing. It is quite a young organization, which allowed me to be really involved in developing relevant innovations and making the impact that I had always been looking for. Working at CITC and at the Noviotech Campus brings many benefits. There is a great sense of community with social activities for those who want to participate. Our neighbours are never far away. I am happy it turned out this way.”

“I have shaped the job to suit me.”

“As a scientist, I want to understand everything from A to Z. But when I became a program manager at CITC, I couldn’t do that anymore, I had to learn to let go. Being a program manager is a very hybrid and dynamic position, so I have shaped the job to suit me. When I talk to customers, I translate their needs to the technical teams to deliver the best product. I understand the work, the technical side, and the needs of the customer. Combining all this is super fun. Letting go was quite a challenge but I trust my colleagues and their expertise, and it feels good to see that everything turns out great without me being involved in every single detail.”

Small achievements, big celebrations

When asked about major milestones, Francesca starts laughing and seems a little hesitant. “One of them is, of course, finishing my PhD. It was hard work, which I did all by myself. I am really proud of that. It sounds a bit cheesy to say”, she continues. “But celebrating small achievements is just as important as celebrating the big ones.” One big milestone she hopes to reach is for CITC to flourish. “Since CITC is still a relatively young company, it is the dream to become well-known in the chip packaging industry. Hopefully one day, we won’t have to explain what we do. I want us to be recognised for our great research.”

With her story, Francesca hopes to inspire more women to pursue a career in high tech, as she sees many opportunities for women to work in these sectors. “There aren’t many women yet, but our numbers are growing. Companies recognise the need for women and diversity, so there are a lot of opportunities nowadays. The work itself is also more diverse than it might appear. At school, we see mathematics and science as something we will never use unless we work in programming or construction, but we have a lot more options than you might think. There are plenty of jobs you didn’t even know existed. There are so many opportunities to build the position you want. You just have to enter the world of science and see for yourself.”

Do you want to inspire other women to pursue a career in tech?

Join Role It Out, an agency for Female Role Models in Tech! Diversity in the work force is a great enabler for high quality, innovation and creativity. That’s why Role It Out is on a mission to inspire more women to choose a career in Tech. Role It Out offers a community of women in Tech and our unique ‘Role Model Training Program’. Join the Role It Out Training Program! Take a look at our website www.roleitout.com, on LinkedIn or Instagram @roleitout. Or contact us for more details info@roleitout.com



“ I love to be part of the Dutch innovative industry!”

Roy Kanjanapornpreecha

As a supply chain manager at Nexperia, Roy knows how to keep the manufacturing process running smoothly.

The thirty-year-old Roy from Thailand came to the Netherlands to “be around the tallest people in the world” and to study Industrial Engineering and Management in Groningen. It’s been five years since he started working in the high-tech industry, and he has loved every minute! He tells us about his experiences as an international student and high-tech employee.

Roy came to the Netherlands in 2012 to study Industrial Engineering and Management in Groningen. “The Netherlands is such a cool country, with good universities and a strong economy. I also liked that Dutch people speak English because Dutch isn’t the easiest to learn.” His studies were mainly about production optimization of the production process and covered topics such as mathematics, physics, chemistry, finance, and marketing. “It gave an idea of how to run a manufacturing business, and the supply chain also part of this.”

“After my studies, I worked in Leiden as a supply chain planner and for ASML in Veldhoven. A friend of mine worked at Nexperia and told me about a new job opening. I applied and have been working here since the beginning of 2022. As a supply chain manager, I help the company achieve the revenue target from the operations side of the business and ensure everything works in the most optimal way. When something goes wrong, we fix it. We also support growth by looking into new products to add to the market and making sure the new product is going smoothly into the market.”

Life after 6 pm

Roy had just finished high school, and coming to the Netherlands, it was as if he had begun a whole new chapter of life. He started adapting quickly but immediately realised that Eastern cultures are far more collective, whereas Dutch culture is highly individualistic. “In Thailand, you immediately become friends with your classmates and colleagues. In the Netherlands, people arrive one minute before class and leave directly after. Luckily, I lived in Groningen, a big student city. I got to know people through parties and activities. I really enjoyed living and studying in Groningen.”

“It’s fun and challenging to have so many smart people around you. My advice for internationals is to just do it”

Roy adds that in Asian countries, life doesn’t stop after six o’clock. “People go out, shop, eat and hang out. I was on a business trip to Taiwan and instantly made friends with co-workers there. It’s a different vibe here, it’s nice but people are a bit more reserved.” Roy says it was easier for him to adapt than it would be for a forty-year-old, since he spent his whole adult life in the Netherlands.

“Of course, the Dutch are direct”, says Roy enthusiastically. “But I like it. In Thailand, people don’t want

I think it’s a good thing that Dutch people say what they need.

to insult each other but also don’t say it if they need something from you. I think it’s a good thing that Dutch people say what they need. It’s not the same thing as being rude. Everyone is respectful, and everyone is equal. There’s no hierarchy; you don’t call your boss ‘boss’. You just use their name. In Thailand, we have a fixed expression to address an older person, even if they are just one year your senior. Here, people are treated more equally.”

Proud to be a high-tech employee

Roy enjoys the vibrant, international, supportive, and open-minded vibe of Nexperia: “It’s an exciting time to be part of this company. When taking care of new products, we work with R&D and marketing. We market new products like the Battery Booster. It’s a brand-new product; there’s nothing like it yet. It’s a chip that improves a lifespan. This chip, for example, is used in wristbands to pay with at festivals. It takes the lifespan of this wearable from about a day to one week. It’s super innovative, and I love being part of it. The new challenges that come with it. No day is the same. New topics are literally everywhere. Amazing!”

Looking back at his journey in the Netherlands so far, Roy’s advice for internationals is to just do it. “Start working in the Netherlands, especially in the high-tech environment. It’s fun and challenging to have so many smart people around. And looking at the bigger picture, it feels great to be part of an innovative industry!”



“Your career is not a ladder, but a train ride”

Carlota Salamat

As Engineering Manager at NXP Semiconductors, Carlota is responsible for the engineering teams.

Fifteen years ago, Carlota moved from the Philippines to the Netherlands and joined NXP to work as a Validation Engineer. She worked on chips for five years and ensured they performed according to the specifications: “When I started my bachelor, 2G and mobile phones were new and upcoming. We went from analogue to digital. During my master thesis, I worked on developing an antenna for Wi-Fi. This is all mainstream now and evolves really fast. So, working in the research department was super

“It’s all about seizing the opportunity and doing your best with what life gives you.”

exciting!”

Carlota got the opportunity to become a manager and is now in charge of the engineering teams at NXP. In her role as manager, she makes sure her team has the correct tools, competences, and that their well-being is taken care of.

Directness

The move to the Netherlands wasn’t quite the culture shock one might expect. “I studied in Japan for years, so I am quite used to different cultures. The flat hierarchy in the Netherlands was something to get used to, though. In Asian countries, the manager has a very different, more leading role.” The well-known directness of Dutch people was also something to get used to for Carlota. “In the beginning, the directness was quite something, but after fifteen years of working here, I came to appreciate the directness, openness and willingness to help. Everyone can voice their opinion and wants to help you find a good solution. We also have great contact with our neighbours on the Noviotech Campus. I really appreciate that.”

Respect and transparency

The directness of her colleagues is not her biggest challenge. “In my job, I have to align individual ambitions with the business goals, which can be challenging. Sometimes there’s a mismatch. So my work also includes letting people go. That can be extremely hard to do.” However, Carlota has a good way of handling those difficult conversations. “I always want to make sure that the other person is heard. I always imagine what I would want to hear if I was in their shoes and try to help them with the transition to a better role. Transparency and respect are very important to me.”

Small steps, big impact

The most exciting thing about her work is the practical side. “The work we do has a lot of impact on the daily life of people. We make chips for communication infrastructures and develop them with the best performance and quality. For example, we look at how we can make sure the performance is great without draining the battery. How many transistors can we fit on a single chip? What can we do better in the future? We are even looking at steps beyond 5G. The work we do now is really shaping the future. It takes small steps, but the impact is big.”

Train station

Carlota makes an impact with her team and also on a personal level. As a woman in tech, it can sometimes be difficult to claim your place. However, Carlota never saw her being a woman as a limitation. “I actually think it is an advantage. Being a woman in a man’s world makes you stand out and enables you to make an impact. The men in tech are also rooting for us women to succeed. This really makes a difference. Whatever your job, find people that are invested in your growth. It really makes a difference.” One of her mentors gave Carlota a new vision for her career: “He taught me that your career is not a ladder, but a train ride. You hop on until the next stop and see where it goes. When you look back, you can see where you came from. If it’s not for you, you can hop off at the next station and take a different route. It’s all about seizing the opportunity and doing your best with what life gives you.”

“Even when you think you are not 100% qualified, try it!”

Finding role models

Carlota has a clear message for other women who want to work in tech: “Have confidence. We can do things the same as the guys, sometimes even better. Women often think they are not as good as men because they don’t have hands-on experience yet. Even when you think you are not 100% qualified, try it!”

When there are few women, it can sometimes be hard to imagine working in the tech world. Carlota’s advice: “Find role models and realise that it’s not just an image in your head, but there is a clear path. Connect with women who have already done it and have self-confidence. Trust that you can figure out things along the way and seize the opportunity. You can do more than you think!”

AN ODE TO MOORE'S LAW – MAARTEN STEINBUCH

MOORE WILL NEVER DIE

18

In 1965, Intel co-founder Gordon Moore observed that the capacity of computer chips doubles every two years; not only describing the industry's exponential growth at the time, but also setting in motion a self-fulfilling prophecy for the technological development of our society in the decades to come. Last year, aged 94, he passed away. As we commemorate his legacy, we take a look ahead: will we be able to keep Moore's Law alive, and do we even want to, given the ecological impact technology has on our planet and its energy resources?



Maarten
Steinbuch

In 2018, I had the honor to meet the Dalai Lama. At the time, I was struggling with the question whether or not a robot can experience human emotions and feelings, like love. So, when I was presented with the opportunity to pick the mind and wisdom of one of the world's greatest spiritual leaders, I asked him: Can a robot fall in love? Can robots develop a conscience, the way humans do? The Dalai Lama smiled at me, and he told me that the deepest level of conscience, our being at its core, isn't something physical or chemical – and therefore isn't something we can build or construct using technology.

The power of tech

But, as I went home I thought to myself, 'what if it actually is?', what if everything – including our feelings and consciousness - is a product or a result of the chemical processes taking place in our brain? Then we can study it, learn from it, try to understand it and eventually maybe even build something capable of performing these same processes responsible for emotions or feelings: we can replicate the human brain with technology. It would take an infinite amount of data, and an even more powerful computer to process – but it would be possible.

I have always been a tech optimist. As a little boy, playing around with the tech boxes from Philips, I learned about the endless opportunities of technology. Technology is my gateway to understanding the world; it's what I'm passionate about. I'm curious about the way things work. So, I became a mechanical engineer. Later on, all grown up, I actually got to work at Philips myself. This is where I first learned of Moore's Law. I learned and saw up close how rapidly electronics evolved from this law. It catalyzed the implementation of deep fundamental knowledge in the industry - setting in motion a wave of technological development which led to modern society and all of its technological advantages.

Moore's Law is about us

To me, Moore's Law is much more than a quote from the Intel CEO in a tech magazine in the '60s. I think of Moore's Law as a formula defining our society, representing human's will to keep moving forward. So far, we've been proving that formula right. Over the past decades, we as humans were able to take a technological leap, setting in motion a wave of exponential growth unmatched in history. Because make no mistake, Moore's Law isn't just about technology, and it most certainly isn't a force of nature – it's about us: people. If we decide to stop innovating, if we decide to stop moving forward, Moore's Law will stop as well.

“IF WE KEEP MAKING SMART DECISIONS, THERE ISN'T A PROBLEM TECHNOLOGY CAN'T HELP US SOLVE.”

Lately, some tech institutes and industry leaders are starting to hold back - saying the Law no longer applies, is beginning to decline and will eventually come to a standstill. But I think and see quite the opposite. I see researchers at TNO investigating and implementing new technologies, like photonics and smart materials. Engineers working at leading Dutch chipcompanies, like ASML, NXP and Nexperia, producing billions of chips that enable our society. And as a lecturer at Eindhoven University, I get to educate the next generation, who are eager and curious to shape the future of technology.

Playing with technology

Don't get me wrong, I'd be the last to say that (new) technology isn't without risk. Of course, it can be scary, and we should be concerned about its ecological impact and how we take care of our energy resources. But let's not forget that we are in charge here. We are shaping our society, responsible for making healthy choices, applying technology in ways that benefits us, our planet, nature and our future. I believe that, if we keep making smart decisions, there isn't a problem technology can't help us solve.

One of my favorite toys to play with is Pleo: a dino-like creature, comparable to a modern-day version of a Tamagotchi. Pleo starts with a blank page, and as you play with it, it begins to learn. It grows, starts to behave differently and grows a character based on its interactions with you. If you stop playing, Pleo stops learning. When I showed Pleo to the Dalai Lama, he instinctively took it into his arms and started to pet it. This interaction showed me that, instead of being scared, we should approach technology with curiosity, kindness and an open mind. This is the way to keep moving forward as a society, step by step. And if we get lost somehow, we can always look at Moore's Law, and see where it got us so far.

Innovation Originals

Our newsroom keeps an eye on weekly articles and news items about the latest innovations in health & high tech. The editorial office selected five headlines from the past year we don't want you to miss out on. Presenting: *Innovation Originals*.



The world's strongest MRI scanner comes to Nijmegen

Parkinson's, ADHD, depression, autism: one after another, brain disorders about which we still don't know nearly enough. Five hundred international researchers at the Donders Institute in Nijmegen, the Netherlands, occupy themselves daily with the many mysteries of our brain and the resulting behaviour. In about five to six years, they will have an important tool at their disposal: the world's most powerful MRI scanner.



**Scan for the full article
by Nicole Beaujean**



NXP wins King Willem I Award

Under the honorary chairmanship of Her Majesty Queen Máxima, chip manufacturer NXP was awarded the Koning Willem I Prize 2022 in the Large Company category. The company, with headquarters in Eindhoven and extensive production facilities in Nijmegen, was spun off from Philips in 2006. The company has approximately 34,000 employees in more than 30 countries and posted revenue of \$13.21 billion in 2022



Even Panamanian students join CITC's semiconductor packaging education

The fourth edition of the Semiconductor Packaging course, an initiative of HAN and CITC, started on 28 August. 49 participants took part, including 4 professors from Panama. "This training is unique in the world", says Joop Bruines.



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top article**



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bottom article**

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Screenpoint Medical AI system Transpara shows promising results to improve breast cancer screening

Prof Fiona Gilbert, Professor of Radiology & Head of Department, University of Cambridge: “This exciting, large, prospective mammography study shows that one reader using AI is comparable or better than the standard of two expert readers. There are considerable workforce savings, which will be beneficial to the UK in addressing our human resources issues. These findings will help plan the testing and implementation of AI in the UK National Breast Screening Programme.”

Source: theengineer.co.uk



Scan for the
full article



Meet the most innovative student of the Netherlands 2023!

Lisanne Peters of ArtEZ University of the Arts may call herself the Most Innovative Student of the Netherlands 2023. She won the growth trip through Silicon Valley and a golden ticket to TheNextWeb Amsterdam 2024 with her initiative Symbiomatter.

Foam is usually based on plastic, which results in a huge amount of waste, because the materials last much longer than the useful life of the product. Symbiomatter offers a solution that is 100% biodegradable. The national competition was launched by Gelderland’s innovation platform INNOVATE and the largest popular science magazine in the Netherlands, Quest. For the third year in a row, they teamed up to find the new generation of changemakers: students who want to make the world more sustainable,

healthier and fairer. A jury selected the eight most promising initiatives from nearly 100 applications from all over the Netherlands.

In September, these eight finalists went through an intensive boot camp with various training sessions and coaching to further develop their initiative. On the final evening, the winner was chosen after a live pitch battle at Muis Arnhem. The jury consisted of Maartje de Gruyter (deputy editor-in-chief of Quest), Christiaan Holland (director of Startclub Arnhem) and Joep Stokkermans (director of R&D ITEC).



Scan for the
full article

Back on my feet

Ton Arts, first tester of the MyoS uite Exoskeleton

When Ton Arts comes out of anaesthesia after surgery, he can only move his head. The rest of his body seems unresponsive. “I was panicking, of course”, says Arts, “but it was also a calculated risk. I had a double hernia and frequent failure symptoms, and the pain was getting worse. Before the operation, the doctors at the St. Maartenskliniek in Nijmegen told me that there was a significant risk of suffering a spinal cord injury. But I had no choice. Without the surgery, I could have ended up with a complete spinal cord injury over time.”

It was September 2014 when Arts, then 57, underwent the operation. After, it looked as if he would never be able to stand or walk again. “I had no control over my arms, I couldn’t move anything. My bowels and bladder were failing; everything was coming out. It was to do with the location of the spinal cord injury. I have a high spinal cord injury, level C4, in my neck. Everything in my body below that point is affected: the spinal cord is partially damaged, so the communication between my brain and my body is not optimal.”

Testing the MyoS uite

For five months, Arts had to undergo rehabilitation treatment at the St. Maartenskliniek. He then had to undergo another four months of outpatient rehabilitation. Thanks to the rehabilitation and his perseverance, Arts is now slowly improving. “At one point, I regained feeling in my big toe. It felt like a small victory. I regained some strength and bladder and bowel control. Eventually, some of the sensation in my body and some control came back.” With some effort, Arts can now stand up again and walk a little bit. At home, he mainly uses the walker. Outside, with the help of crutches, he can walk a maximum of a hundred and fifty metres. Despite his limitations, he is not sitting idle.

He took part in a sailing camp, organised by the St. Maartenskliniek and the Handbike Battle in Austria. After seeing him in an educational video, rehabilitation specialist Ilse van Nes contacted him and asked if he’d like to test the MyoS uite: a soft exoskeleton, that helps people with incomplete spinal cord injuries to stand and walk again.

Further improvement

“Of course”, says Arts, “I accept every challenge!” In early 2023, under the supervision of a physiotherapist at the St. Maartenskliniek, he started training twice a week, to get used to the robotic suit. On 21 March, he took it home for six weeks, and the real testing began. “The suit actively supports my walking movements, which is very nice. When I walk with crutches, I lean forward slightly. The suit pulls me upright, allowing me to roughly double my walking distance. I particularly benefit from this when I am outdoors. At home, it’s easier to use the walker. Because of my limited motor skills, putting on the suit with its Velcro fasteners is very difficult, and I need my wife’s help. To control the suit, you have to carry a six-pound battery on your back, which makes it uncomfortable to get into the car or sit in a chair.”

Testing the suit in practice provides a lot of valuable information. “When I cook, I hold on to the countertop and slide from side to side. This is hardly possible when wearing the suit, as it mainly supports forward movement, and not sideways sliding.”

“On the positive side, the display is very easy to use, and you can adjust many functions to suit your personal situation.” Arts hopes that his experiences and suggestions will be used to further improve the suit. “I can only applaud the development of innovative techniques to support people with spinal cord injuries!”

Robotic rehab

Ilse van Nes, Rehabilitation specialist at St. Maartenskliniek, Nijmegen

“It is a fantastic time to be a rehabilitation physician”, says Ilse van Nes. “We can now use technology to help people with things they can’t do for themselves, or can’t do well. That’s a great benefit for spinal cord injury patients, and it’s very inspiring for a rehabilitation doctor to be involved in.”

Caring for patients with spinal cord injuries. This is what Ilse van Nes, rehabilitation physician at the Spinal Cord Injury Department of the St. Maartenskliniek has been doing since 2008. Some patients have a complete spinal cord injury, where the brain and body are no longer communicate. Other patients have an incomplete spinal cord injury, where part of the connection is still intact.

The effects of a spinal cord injury depend on where the damage is located. For example, a high spinal cord injury may also paralyse the arms, whereas a low spinal cord injury may only cause problems from the hips down. “In addition, a spinal cord injury has many ‘invisible’ effects”, says Van Nes. “Think of bladder and bowel problems, problems with sexuality, less skin sensation because nerve impulses don’t get through, disturbed body balance, and so on.”

Encouraging exercise

Van Nes combines patient care and scientific research, which she believes is ideal, because the most important research questions arise during care. The St. Maartenskliniek is all about optimising chronic care. Van Nes: “One way we try to do this is through the comprehensive aftercare clinic, where the entire team examines all patients with a spinal cord injury every two years. We also look at ‘invisible’, secondary complications, such as a low bone density, possible wounds and infections, spasticity and bladder and bowel problems.” Another essential part of their approach is to get patients moving as much as possible. Exercise has health benefits

in almost every area. “So we strongly encourage patients to move”, says Van Nes. “We have done this so with a rigid exoskeleton in patients with complete spinal cord injuries. These patients cannot walk on their own, but with the help of such an exoskeleton and a lot of training, several people have managed to walk again.”

Soft exoskeleton

Meanwhile, with a TopZorg grant from ZonMw, Van Nes and colleagues have also started their research on the MyoSuit, a soft exoskeleton that is considerably cheaper, more flexible and easier to use than the hard exoskeletons used for patients with complete spinal cord injuries. Van Nes: “Theoretically, some patients with incomplete spinal cord injury can put on such a MyoSuit themselves. We are investigating whether this is actually the case and whether the suit also leads to them walking more in their home environment.”

The St. Maartenskliniek has purchased four MyoSuits for this study. The participants will be able to try out the suit for six weeks, to experiment in their everyday environment. Do they use the suit, do they walk more and further, is it user-friendly enough, or do they quickly cast it aside? “We use sensors to monitor actual use”, says Van Nes. “And we conduct user interviews to find out what they like and dislike about the suit. These factors will determine its success. For the time being, anyone who wants to continue using the suit after the study is over, will have to buy it themselves. Dutch health insurance companies do not (yet) reimburse the purchase.”

Are urban innovation districts the future of healthy, smart and sustainable living?

In the 2030 Agenda for Sustainable Development, the United Nations defined a framework of seventeen goals aimed at designing and implementing a “shared blueprint for peace and prosperity for people and the planet, now and in the future.” One of the goals is to design sustainable cities and communities, to achieve more inclusive and sustainable urbanisation, reduce the environmental

impact of cities and create affordable and sustainable transportation systems. Together with leading experts in the field – Kari Eik (USC), Jacques van Dinteren (IADP) and Paul Jansen (IADP) – we explored this trend and looked at best practices worldwide and their impact on innovation districts and campuses in the Netherlands.



“We need to take care of our cities.”

“In the future, eighty per cent of people will live in cities”, says Kari Eik, initiator of the USC (United Smart Cities), a global UN initiative for urban development and smart cities. “That’s why we need to take care of our cities.” In many parts of the world, there is a trend towards infill development rather than expansion on the outskirts of cities. This usually involves using existing industrial sites to develop a combination of living and working. Sustainable and smart.”

“Never talk about Smart Cities without talking about sustainability. They always go hand in hand”, she says. “How can a city be smart without being sustainable? We want to do something for future generations. Cities need to be intelligent, smart and sustainable. The UN defines a smart city as “an innovative city that applies information and communications technology together with other means to improve the quality of life, efficiency of urban services and competitiveness, and to meet the needs of current and future generations on economic, social, environmental and cultural aspects.”

Kari: “Throughout history, Smart Cities have always been very much linked to technology. However, it depends on where you are and what stage your city is in. We have three levels of innovation, Economy, Environment and Culture of the local community. So it’s very broad. Technology is an enabler. Digitalisation plays an important role in all areas. We also have 12 categories. Five of them are at the top: energy efficiency, mobility, transportation, security and housing, engagement and health. They are all interlinked. We don’t want to think in silos anymore.”

Productive cities

Intensive mixing of living and working can also be a means of renewing neighbourhoods or

districts. Importantly, productive cities also mix social classes. Productive cities mark a return to how cities were developed centuries ago, but with significantly less pollution and safety risks.

“Many European cities have been redeveloping so-called ‘brownfield sites’ for decades - a strategy of urban densification rather than urban sprawl. In Germany, for example, Vauban, a car-free, child-friendly district of Freiburg, was built on the site of a former military base. In Austria, Vienna’s huge new urban district, Seestadt Aspern, is being built on the site of the former Aspern airport.” Brownfield sites are often infill locations with existing transportation and utility infrastructure. Redevelopment on infill sites can use vacant buildings, parking lots or other underutilised sites for new facilities, homes and businesses. But it is not just about infill. A more recent development is that of innovation districts. These involve the transformation of an existing city district into a mixed-use area. Here, innovative companies play a leading role.

Jacques van Dinteren, president of the Nijmegen-based Innovation Area Development Partnership (IADP), is involved in these developments: “One of the reasons for the emergence of this concept is that a centrally located city district with good public transport, many facilities, attractive housing and a pleasant living environment appeals to the young generation. More so than a monofunctional science park located on the edge of town. For local governments, this raises the question of whether there is enough potential to develop an innovation district; and as such, a project will have to meet strict conditions.”

Innovation districts in the Netherlands

Following this line of thought, it is not surprising that many plans for innovation districts have

recently been announced in the Netherlands. “Yes, it is true”, says Paul Jansen (vice president of the IADP). “And this is quite remarkable because, in other countries, we see comparatively fewer initiatives. An innovation district should not be used as an excuse for urban transformation. Such a district is, first and foremost, about socio-economic renewal. After that, urban renewal can be a prerequisite.”

The Netherlands faces major challenges in the coming years: regional economic recovery is key. In addition, a million new homes will have to be built, while at the same time meeting the 2030 climate targets (in terms of energy transition, CO₂ reduction, other mobility). Moreover, suppose that by 2050 Dutch cities decide to densify inner-city areas instead of expanding outwards. In this case, according to research by Ecorys, this will generate more than €1.2 billion in added social value. We looked at three Dutch cities to find out how they are shaping and designing their cities and how innovation districts and campuses are sometimes catalysing this development.

1. Utrecht: shared transportation and biodiversity

Several brownfield redevelopments are underway in the city of Utrecht, particularly the proposed car-free Merwedekanaal district, built on an island of derelict factories, is one to watch. It will include large area of green and open space; schools, kindergartens, sports facilities, commercial and retail space, and 6,000 residential units of various types, including social housing. All buildings will be highly energy efficient. The planners are also focusing on biodiversity and on connecting the neighbourhood to the wider region through cycling, walking and public transportation.

Merwedekanaal will house 12,000 people on a 60-acre site in the south-west of Utrecht, with an emphasis on walking and cycling and public transportation linking to all parts of the Netherlands. A fleet of shared cars and bicycles will be available to all residents. Instead of one (or more) car per household, there will soon be one car for every three households on the streets.

2. Rotterdam: the city of change

Another good example of a comprehensive approach is the city of Rotterdam. It is currently undergoing a massive change in spatial planning policy. This is based on the recognition that status quo planning is preventing the kind of rapid urban change we need to meet the UN cli-

mate goals. As a result, Rotterdam is taking steps to ensure rapid transformations in mobility, housing, industrial sites, open space and climate protection in the coming years. Important trends at play are the ageing population, the emergence of a network society, the digital transition, the increase in circularity and related climate change and the mobility and energy transition. Rotterdam is using its reinvention as a selling point by calling itself the City of Change.

3. Nijmegen: working and living in a healthy and future-proof environment

Under the banner “Old city, young vibe”, several thousand new homes will be built in Nijmegen over the next twenty years, with the focus on the Winkelsteeg district. The aim is to transform the area, which is currently dominated by businesses, into a healthy, vibrant and sustainable place to live and work. This will mean, among other things, the arrival of 3,000 additional jobs, 4,000 homes and various facilities.

The construction of 500 temporary social housing units in Nijmegen is about to start. On the edge of the new district, along the existing canal that connects the Meuse and Waal rivers, a new waterfront will be created with housing, businesses and hospitality. The plans also include plenty of space for greenery and sports. The green public space will also provide better water retention. This will help prevent flooding during heavy rainfall and excessive heat during long periods of drought. Climate adaptation is taken into account in the design of the buildings and the green and water structure. One way of doing this is to ensure that water is retained in the ground as long as possible and that heat stress is avoided as much as possible. Green spaces mean space for flora and fauna, contributing to improved biodiversity in the area and more green in the living and working environment.

The ambition is to transform Winkelsteeg from a business park into a working, living and leisure area. Nijmegen alderman Noël Vergunst, responsible for urban development said: “A few years ago, we agreed on an environmental vision for Nijmegen. It states that we expect Nijmegen to grow. This land is needed for employment and housing. But at the same time, we should also accommodate growth within the city limits. We tried to find space within Nijmegen and saw that a lot of space in Winkelsteeg was not yet used to its full potential. This gave us the idea of combining living and working in Winkelsteeg.”



Sketches of the Winkelsteeg area, Nijmegen, The Netherlands

Throwback: Winy Maas about Noviotech Campus and Nijmegen

In an interview with Pulse last year, world-renowned architect and urban planner Winy Maas shared his vision of living, working and leisure in cities and how, in his eyes, they physically belong together. He is an advocate of business and industry within the city. "If you can do that within the city, it helps to reduce mobility. The campus in Nijmegen hooks into this painting in a number of ways. First, by improving the station at that location, you provide better public transportation. This allows for densification, mixing and greening. We mainly look at the inner-city

buildings and how we can make them suitable for densification." He continues: "I am an advocate of industry within cities. We have to work hard to make industrial processes such that you can live above or next to them. And that without nuisance from noise, waste or explosion hazards."

Read the interview with Winy Maas in the previous edition of Pulse Magazine:



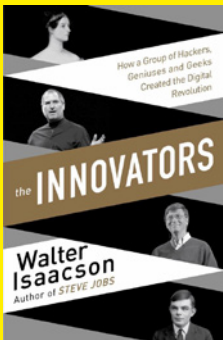
DON'T MISS OUT

This content is king:

Standing on the shoulders of giants. Our editorial office selected books, podcasts, series and other content to feed your mind and keep you updated on innovation, science and entrepreneurship in health & high tech. Enjoy!



Back 2 the Future: Innovator's Classics



The innovators

Isaac Walterson

In this bestselling innovation classic, Walter Isaacson - Professor of History at Tulane University and known as the author of amongst others the Steve Jobs biography - explores how a group of inventors, hackers, geniuses and geeks created the Digital Revolution.

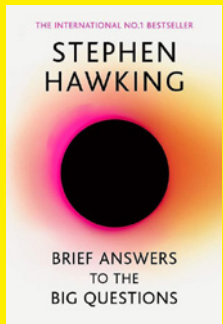


The whole earth catalog - now back online

Counterculture magazine The Whole Earth Catalog - published several times a year from 1970 to 2002 by Stewart Brand - has now made available a nearly-complete archive of Whole Earth publications online.

28

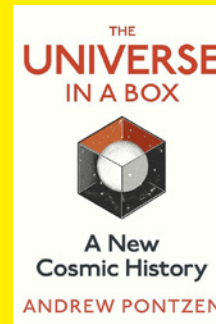
The Bigger Picture



Brief Answers to the Big Questions

Stephen Hawking

Is there a God? Can we predict the future? What is inside a black hole? And how do we shape the future? British physicist and mathematician Stephen Hawking shares his personal view on the challenges we face as a species, and where we are heading next.



The Universe in a Box

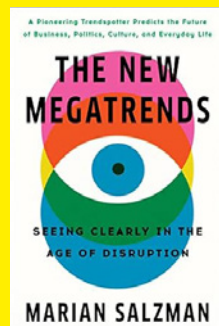
Andrew Pontzen

A unique insight into the technical aspects of simulations while making you think about the big questions of the universe.

The new megatrends

Marian Salzman

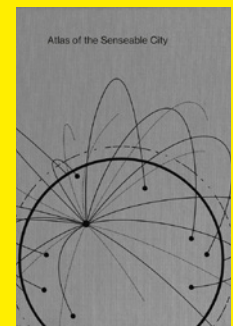
Based on history, data and intuition Marian Salzman predicts the trends and technologies she believes will shape global culture and commerce in the decades to come.



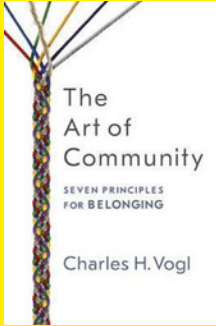
Atlas of the Senseable City

Antoine Picon & Carlo Ratti Yale Univ. Press (2023)

In this complex, highly illustrated collection of digital maps, lab co-founder Carlo Ratti and architecture historian Antoine Picon analyse four essential urban dimensions: motion, connection, circulation and experience.



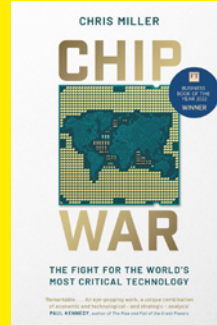
Changemakers in health & high tech



The art of community

Charles H. Vogl

A guide to building and cultivating cultures where people help and support one another, share their drive, and achieve big goals together.



Chip War

Chris Miller

The impact of the microchip industry as a driving force behind the Western economy, and the potential threats and opportunities posed by the influence of China.

Viruses

Marilyn J. Roossinck

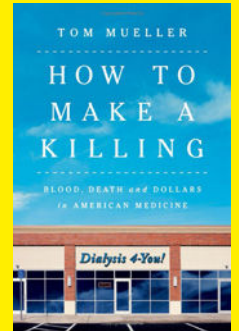
Virus ecologist Marilyn Roossinck stresses that not all viruses are agents of disease: some benefit their hosts by helping to protect them from other microorganisms, or helping them to perform new functions.



How to make a killing: Blood, Death and Dollars in American Medicine

by Tom Mueller

How did a lifesaving medical breakthrough become a for-profit enterprise that threatens many of the people it was meant to save?



Listen:



Nature

Brain-reading implants turn thoughts into speech. Two studies demonstrate how brain-computer interfaces could help people to communicate.



Nijmegen Entrepreneurial Podcast (Dutch)

Charles Smit, managing director at Nexperia, talks about how a company with such a big impact on the world can continue its mission while driving innovation and complying with strict industry standards.



Briskr AI for life

A podcast about how AI innovations analyse medical images, the way they speak to your emotions, filter meaningful information from huge data repositories and control robots in healthcare.

Watch:



De Universiteit van Nederland: Bas Bloem

Professor Bas Bloem (Radboudumc) explains how pesticides can invade and destroy our brains.



The Dropout (Disney+)

The story of the rise – and fall – of the biotech company Theranos and its founder, Elizabeth Holmes.



Black holes: the edge of all we know (Netflix)

Follow the search of scientists for black holes and their attempt to photograph a black hole for the first time.

What inspires you? Send it to pulse@noviotechcampus.com!

CROSSING BORDERS – CHRISTINA QUENSEL

In the international biotech hub Berlin, the Campus Berlin-Buch (CBB) is growing to become the beating heart of future innovation. On the biomedical campus, scientists from all over the world work on the future of medicine. Christina Quensel – CEO of the campus – tells us all about the CBB, her journey and her vision for campuses and tech parks around the world.

A biotech
campus
with

*the vibe
of Berlin*

What does a day in the life of the CEO at CBB look like?

“For me, every day is a new adventure. There are so many dimensions to our campus. It’s really a mix. It’s my responsibility to think about the future of the CBB and how we want to pave the way for healthcare innovations. My job is truly diverse: politics, administration, negotiations with the district government, public relations, and, especially, education.”

“Art can be a way of presenting science, to show people what it’s all about.”

Why education, specifically?

“Because I personally experienced the impact education can have on the course of your life, and the course of it. I studied Biotechnology, worked on my PhD in the pharmaceutical industry, and as a postdoc at the Max Delbrück Center here on campus. And later, I switched to an administrative role as scientific referent to the scientific director of the Max Delbrück Center. I learned a lot during this period and nowadays, I’m experiencing the benefits of this scientific background in my role as the CEO of the Campus Berlin Buch GmbH, the operator of the Biotechpark and the campus. When I was asked to take on this role in 2015, I didn’t have to think too long and immediately said ‘Yes!’”

What convinced you to take on the opportunity?

“At Berlin-Buch, more than 3,000 employees work for 70+ companies. Our Biotechpark has around 31,000 sqm of office and laboratory space, with large research centres and huge clinics. Seeing all these dimensions come together is something really beautiful – and facilitating and nurturing this community is what matters most to us. That’s why the companies on campus lack nothing. Employees can get coffee, go to the fitness studio or enjoy one of the outdoor exhibitions. This way, the biotech companies on our campus can find new collaboration partners in an approachable and personal way.”

Okay, we get it: connection and collaboration are important. But what sets you guys apart from other campuses?

“What’s really unique to this campus, is the vibe, energy and background Berlin as a city brings to the table. Berlin is the beating heart of bioscience and innovation and the city with the most international students in Europe. You can live here without speaking any German. We have three huge universities and lots of non-university research institutions. It also brings many highly educated, international, and motivated people to campus.”

“The city also greatly supports science and innovation. One example is the yearly Long Night of the Sciences where everybody can participate in experiments, get in touch with scientists and learn about current groundbreaking research. It allows us to introduce a broader audience to what is happening in terms of science in Berlin.”

Why is it that you consider Berlin to be the beating heart of bioscience and innovation?

“In Berlin, we work together. Many of Berlin’s biotech/life science players meet regularly. We have developed a good level of collaboration. We discuss the future of medicine together. That way, we can make the most of it. Many companies work competitively, but in Berlin, we are opening up and always try to find one another. For example, we have access to the largest University Hospital in Europe. So, Berlin offers high potential for open communication: you can quickly discuss innovations with the right people. We quickly know if an idea can really work or not.”

How does your campus reflect the city’s open attitude?

“We are an open campus, which means that everyone has access to our campus. We believe that in order to make a lasting impact, we have to openly share and transfer knowledge and work together – these are our core values. What’s more, we explore new perspectives of science and innovation through art. I think art can be a way of presenting science,

to show people what it’s all about. We have many statues and original paintings on campus – thanks to our strong ties to the art community within the city. And because everybody can visit the campus, everyone can come and enjoy our artworks.”

What about the future – any big plans coming up?

“The pandemic made it very clear that innovation is necessary and needs space to develop further. Also, it pointed out that biotech is more important than ever – as an area of expertise where we learn more about the combat against and prevention of future pandemics. That’s how the idea of the BerlinBioCube came about. In this new building of about 14,000 sqm, we are creating even more space for startups in biotechnology and medical technology. We will ceremonially open the building on 11 October 2023. It will be the next step in the development of our biotech park and a great first step for future innovation in the city.”

What does the future of innovation mean to you?

“To me it’s all about people. I like to think of campuses as a melting pot where scientists and entrepreneurs come together and bring the knowledge from science to patients even faster. People need each other to cross borders and make change happen. And our community facilitates that melting pot. With its food courts and parties, this is the best place for meeting each other and interacting. That’s where we discuss our work and make valuable connections with the right people. For example, to review innovative ideas or find the best collaboration partners. Only when we work together, we can push medicine forward.”



Dr. Christina Quensel
CEO of Campus
Berlin-Buch GmbH

4 generations in high tech

The semiconductor industry is celebrating its 70th anniversary. What did that journey look like? How did we get from the first transistors - your (grand)parents can tell you all about it - to chips that use light and quantum mechanics to enable our everyday lives? We interviewed four generations of people working in the world of chip technology, as they shared their stories, dreams and hopes for the industry.



RICHARD BINNENDIJK: HELD VARIOUS POSITIONS AT PHILIPS IN NIJMEGEN FROM 1965 TO 2003.

Our world runs on chips. Richard has witnessed this development from the very beginning. In 1965, he started at Philips in Nijmegen. Over the subsequent almost 40 years, he held various technical positions and watched the company grow tremendously. These days, Richard is occupied with the Novio Experience Museum (NEM): a foundation dedicated to preserving the high tech heritage of Philips and NXP. Richard takes us back to the early days of chips, transistors and high tech history.

You joined Philips when computer chips and transistor technology were in their infancy. What was the work like back then?

“In the past, there was a lot of physical work required. Back in the day transistors, the predecessor of a chip, were put together by hand, one by one. With time, this procedure became more automated. Assembly lines were

introduced first, and then machines gradually took on more responsibilities. Until the late 1960s, people did all design and calculations by hand. It wasn't until the 1990s that we started using computers!”

From transistors to chips, that seems like a large step. How did you go through this transition?

“The shift from transistors to chips may seem like it was a big deal, but the basics are still the same, just on a smaller scale. Parts have become smaller and need to be more precise. I believe the biggest change we made required creating our own precise machines because we couldn't find any available elsewhere. Additionally, I spent some time functioning as a manual component tester.”

In your opinion, what caused the success of the Netherlands – and especially Philips – in making computer chips?

“During my time working for Philips, I moved around to several departments, building connections with many people. This allowed me to stay up-to-date on everything happening within the organization. We frequently worked together, with a relaxed and informal atmosphere. There was minimal hierarchy, and everyone could easily mingle and communicate. We always wanted to try new things and loved our job and the things we were working on. This mindset, along with a culture of trust, created a fertile environment for innovation and progress.”

What is your vision on the future of chip technology?

“We've made a lot of progress, and I'm proud to have been a part of that. However, we have to be cautious not to rush things. What used to take a year now happens in a month. When something is possible, we quickly put it into action. As a result, we don't always take enough time to consider the implications of our technology. At times, it seems like we're taking a step forward without fully understanding where it will lead us. If we keep considering how we're going to introduce new technologies in the future, we can go very far.”

1958



JOOP BRUINES: MODULE LEAD SEMICONDUCTOR PACKAGING AT HAN & CHIP INTEGRATION TECHNOLOGY CENTER

Joop started his career in the chip industry in Eindhoven, at Philips. He was involved in the building of the French chip factory Crolles¹ and the Nijmegen chip factory ICN8. Now, he is responsible for educating a new generation of high-tech students in the Semiconductor Packaging course at HAN and CITC.

How did you get involved in the semiconductor world?

“In 1989, I stumbled from research into the world of chips at Philips, just in time to experience the Centurion crisis. That was a strange period: Operation Centurion was a big reorganisation for Philips. In Nijmegen, people were laid off because the plug was pulled on the European mega-project with Siemens. At the same time, we were moved from Eindhoven to Nijmegen. Later, Philips partnered with STMicroelectronics and France Telecom. And they build a development centre and factory near Grenoble: Crolles¹.”

“I was one of the first people sent by Philips to help start up the French factory. A few years later, I did the same with the ICN8 factory in Nijmegen. That factory was only half furnished. We were responsible for the other half. It

was surreal: the five-story building didn't even have floors yet. It was aptly nicknamed 'The Cathedral!'”

What has been the biggest change in the industry for you?

“The biggest change for me in the past decades was the emergence of integrated circuits (ICs). That development not only meant a lot for the industry, but for our whole society. What a breakthrough! Smartphones, laptops, you name it: none of it would have been possible without ICs. Before we were able to integrate, we were working with discrete elements. That means that everything was very bulky, because every element needed its own space, and energy hungry. Because of integrated circuits that no longer was the case, and we were able to develop a generation of smarter, leaner and faster chips.”

How did you end up at the Chip Integration Technology Center in Nijmegen?

“In my last years with NXP, I did a lot of work promoting the technical field at primary and secondary schools. I noticed that imparting my passion and knowledge was something I enjoyed a lot. When CITC was still in formation, I asked them if they had an educational job for me. They told me they wanted to set up a course together with HAN, NXP, Nexperia and Ampleon, and asked if I was interested in leading that project. Of course I was!”

How do you see the Dutch chip industry developing?

“The biggest role the Netherlands can play in the chip world is in chip design. The ChipDesignNL consortium is now working hard to create a bigger role for us in that area of development. On the other hand, we can also make great strides in the field of optical chips. NXP produces electrical chips, but both types of ICs are complementary. SMART Photonics from Eindhoven produces such optical chips. They recently received a 100-million-euro investment from NXP, ASML and the Dutch government, among others.”

“I'm glad and proud to see the chip industry is still flourishing. Of course, we have closed three factories in recent years. But ICN8, the factory I helped build, is bursting at the seams! NXP is very good at combining technologies. Think digital and analogue, but also digital and RF. These kinds of innovations, we do well in Nijmegen and the Netherlands. Cross-functional thinking and exploring boundaries. That's where our opportunities for the future lie!”

“Because of integrated circuits that no longer was the case, and we were able to develop a generation of smarter, leaner and faster chips.”

1985



JUDY TILLAK: PRINCIPAL PRODUCT QUALITY ENGINEER AT NEXPERIA

Judy Tillak has extensive experience in the field of microelectronics. In the previous twenty years, she finished multiple studies and worked at various companies worldwide. Currently, Judy works at Nexperia, where she helps the company to bring products, specifically integrated circuits for social electronics, into the market by assuring the high quality and reliability of their production.

What led you to the world of computer chips?

“My father is an electronic engineer, so ever since I was little, I have been surrounded by electronics. Basically, it was a natural path for me to follow. I started immediately with integrated circuits and did my bachelors and masters in microelectronics.”

How did you end up working at Nexperia?

“Nexperia gives me an opportunity to grow into more mature roles in electronics and circuit design. That was my primary goal when I switched jobs. Before I came here, I used to work for a small startup company here in Enschede, which was amazing and challenging as well. However, at a bigger company like Nexperia, I was able to actually see the real big world of electronics.”

What changes have you noticed, moving from a small start-up to a large company like Nexperia?

“Many changes on many levels. In the way of working, but also in the way the teams are structured. The diversity in experience is much larger in a bigger company. At Nexperia, I work with people from different backgrounds but also with different experiences. That makes it a little bit more interesting in the sense that I’m learning much more.”

“In the way of working, what is to be done and expected is more put in place compared to smaller companies. Getting into these processes allowed me to learn much more about how product introduction is being done in a big corporate world.”

“My job has room for critical thinking and creativity but within the boundaries of what is expected from me. At a startup company, the sky is the limit. Basically, anyone can do anything they want, and that doesn’t necessarily mean that it’s working towards the product introduction. I did enjoy working there, and I’m really grateful for that opportunity to meet people, share ideas, and experience a lot of good energy and great dynamics. It’s not better or worse, just very different.”

What do you think the future holds for the chip industry?

“When it comes to the quality of the organisation, meaning knowledge and experience, I can see Nexperia growing organically and sustainably. And I see a future in this type of development.”

“I’m pretty confident that the semiconductor industry, and especially essential electronics, will continue to grow. We’re going to find new markets and new challenges where we need to find our path. Artificial Intelligence, for example. We don’t know what is going to happen, but we can all see something big is on the horizon.”

“At a bigger company like Nexperia, I was able to actually see the real big world of electronics”

What is your personal vision for this future?

“Sustainability and sustainable growth are very dear to me. It’s something I’m trying to make part of my life, and I’m trying to advocate as much as possible within my organisation as well by addressing the small changes that will make a significant impact in the future. The growth is there, and the future is bright. What I want to emphasise is that we can do even better.”



**MAHAD SAEED: STUDENT
MECHATRONICS SYSTEMS ENGINEERING
AT HOCHSCHULE KLEVE**

Mahad studies Mechatronics Systems Engineering at the Rhein-Waal University of Applied Sciences in Kleve, Germany. He attended the minor Semiconductor Packaging at HAN, and will soon start his first job at the Chip Integration Technology Center (CITC). In his opinion, this was one of the best decisions he has made in his academic career so far.

Why do you feel like studying mechatronics systems was one of your best decisions so far?

"I had a broad idea about semiconductors before coming to Nijmegen for the minor. But I didn't know anything about the manufacturing aspect. When I was still looking for an internship, our university offered the minor. To learn more about it, I contacted a senior who attended the minor the year before. He was very positive!" It was also at this time in my studies, that I felt I had to learn something I could use later on in my career. The senior student warned me that this minor meant less partying and more studying. Not your normal exchange student life, where people go to Spain for sangria. But I liked the idea of getting this knowledge. Combined with the news about the chip shortage, I was certain there would be much work in this field."

"Starting in this field can be pretty scary: everybody is so intelligent!"

What was it like to begin working in this sector?

"Starting in this field can be pretty scary. Everyone you speak to is highly intelligent; most of the time, these people have been working with chips for years. But I learned you need some patience: the seniors want you to succeed too, because they are passionate about this industry."

"When I began working, I didn't have a lot of experience in the field yet. However, because my father was an engineer I was always around circuit boards as a kid. Very different from chip packaging, yes. But I'm not surprised about my interest! In my bachelor, there were some courses about analogue electronics. These courses were highly theoretical, and I didn't enjoy them. During the packaging minor, I saw things in a different light. What does a chip do, how do we design it optimally, and what are the best options?"

What do you think about your future in the Dutch chip industry?

"I think the Netherlands play quite a crucial role in the European chip industry. Everyone talks about corporations like NXP and ASML. Prior to the minor, I didn't know that the supply chain in the chip industry was so convoluted. It's more a network than a chain. There are a lot of important countries in that supply chain. The US, Thailand, Malaysia and Taiwan. But the Netherlands is up there. For Europe, this country is way more important than Germany, for example."

"The Netherlands are crucial to the European chip industry."

"For the future, I see many opportunities in photonics. Physical limitations are holding back the further development of electrical chips. We need a lot of research, which is great news for me. We didn't solve the chip shortage yet, so there is a lot of ground to cover. The industry needs more people, which means that there are a lot of opportunities for people from my generation. This year may be all about AI and neural networks, but let's be realistic. Changes in the world of chips, will trickle down to all other industries. We are the base of all other fields, because computers run on chips."

9 STARTUPS TO KEEP AN EYE ON

Startups are shaping and changing healthcare innovation. We selected nine startups whom we believe are on the road to make a lasting impact, while growing a healthy and sustainable company.



1: VivArtX

Founder: Dan Jing Wu

Here to: revolutionise breast reconstructive breast surgery in women who have undergone breast tissue removal after breast cancer diagnosis. They offer a revolutionary synthetic, degradable biomaterial to achieve excellent cell engraftment, which results in personalised breast reconstruction and ultimately regeneration.

Contact info: www.vivart-x.com



2: Aerocount

Founder: Beate Stevens

Here to: Create air quality measurement networks,

to find emission sources for indoors and outside. Currently, people in the Netherlands unknowingly smoke two packages of cigarettes per week, just by breathing. The lower the amount of particulate matter, the less irritation in the lungs. They visualise an invisible problem.

Contact info: info@aerocount.nl, www.aerocount.nl



3: Micro Cosmos

Founder: Eef Lamers

Here to: accelerate patient recovery by providing a portable and effective healing environment. Their dome is designed to reduce noise and light, significantly improving the quality of patients' sleep. By enclosing the Micro-Cosmos dome, they create a pleasant shield against external disturbances, fostering a sense of security and privacy. The dome also helps people with dementia experience fewer nighttime awakenings, leading to decreased instances of getting out of bed.

Contact info: www.micro-cosmos.eu/nl



4: Zereau

Founders:

Alex Hol, Erwin Koetse, Bart Boots, Mattijs Maris

Here to: clean wastewater from hospital wards to combat hospitals' impact

on water chain pollution with medical (residual) substances and combat antibiotic resistance.

Contact info: www.zereau.com



5: Tworby

Founder: Bob van den Berg

Here to: keep people moving and vital while maintaining their own bicycle. This way, they enable an improvement concerning self-sustainability, freedom, vitality and (road)security.

Contact info: bob@tworby.nl, www.tworby.nl



6: Orikami

Founders: Bram den Teuling, Andres Lamont

Here to: Here to: implement digital biomarker based products to enable personalised healthcare for people with chronic diseases.

Contact info: info@orikami.nl, www.orikami.ai



7: Predica

Founders: William Leenders, Marco de Boer

Here to: reduce the enormous number of overdiagnoses and overtreatment in cervical cancer screening. Based on the CervicaDx test, they can tell which HPV infections are dangerous and put a woman at risk of cancer. Predica strives to make such precision diagnostics the norm, enabling doctors to test before initiating treatment. Predica is actively working to expand its scope in the field of oncology.

Contact info: www.predica-diagnostics.com



8: TropiQ

Founders: Koen Dechering

Here to: provide enabling technology for the elimination of infectious diseases and improving health by combating malaria, dengue and Zika fever. Contact info: www.tropiq.nl



9: Suweve

Founder: Wouter Witteman

Here to: enable wheelchair users to have social interaction with their pusher during a walk. Our wheelchair accessory allows anyone to temporarily transform almost any manual wheelchair into a reverse wheelchair in a matter of seconds, allowing and improving both verbal and non-verbal communication.


Contact info: contact@suweve.nl

COLLEGE TOUR - MARC VAN RANST

Brave and bold in the battle against *fake news* and *conspiracy* *theories*

38

In Bruges, he got a pie and the word 'murderer' thrown in his face. On social media, people commented that it should have been a rock, a brick, or a bullet. Earlier, he and his family had to go into hiding for weeks because of death threats by a professional soldier. Welcome to the world of scientist and virologist Marc van Ranst, who will receive an honorary doctorate from Radboud University Nijmegen on October 17, 2023. We talk at the Gasthuisberg campus in Leuven, where he works.



Why the hatred and incessant threats? Because Van Ranst rates science higher than gut feeling? During the covid pandemic, he preferred his searching ratio over unfounded 'opinion-itis'. In an uncertain, pandemic time, he keeps his back straight and continues to inform people based on scientific information and insights. More than enough reason for the centennial Radboud University to present him with an honorary doctorate.

A physician and a researcher

Marc van Ranst is a virologist. He studies the evolution of viruses. How do they develop, how do they evolve? Early in his career, he mainly analyzed the human papillomavirus (HPV) that can cause cervical cancer. He proved that the goodness or badness of this virus can be read from its sequence, its genetic code. This knowledge is still used today. After the discovery of the corona viruses, Van Ranst went to seek antivirals to protect against the virus, among other things. This already refers to his other, more clinical task, with patients at the core. Because in addition to being a researcher, Van Ranst is also head of all laboratories at the Gasthuisberg campus, where the Leuven Academic Hospital is located. In 2006, the Belgian government appointed him commissioner in charge of crisis management during an emerging pandemic. Already in 2009, people feared for such a pandemic with the swine flu, which fortunately turned out to be less dramatic. It would turn out to be a dress rehearsal for the 2020 SARS-Cov-2 outbreak; the covid pandemic.

There is no 'ideal number' when it comes to deaths

Were we adequately prepared for the covid pandemic, we ask Van Ranst when we speak to him at the Rega Institute in Leuven.

"There was a lot happening concerning pandemic preparedness, but the covid pandemic still managed to surprise us. Having no effective drugs against the virus, no good antivirals, that was a very weak spot in our defenses. Many research applications to develop these drugs had been rejected in the previous years. It was not a priority. The pandemic made it clear that we need a broad spectrum antiviral, a drug that works against multiple viruses. Of course, these things are expensive, but the cost of a pandemic is astronomical. Set against that, it is an excellent investment. The European Funding Agencies did kick off post pandemic initiatives, but as a 'veteran of a few smaller pandemics', I know that the interest usually wanes quickly as well. That would

be the organisational aspect of the answer. There is also a psychosocial element to it. That says: whatever we do, it will never be enough. There is no perfect preparation for a serious pandemic. Because it is never completely predictable. So you sometimes have to be somewhat pragmatic by necessity. Because even during a pandemic, the goalposts keep shifting. 'Well managed' is not a statement that fits a pandemic. There is no ideal number of deaths. Are there few, then it is said that the measures were far too strict. If there are (too) many deaths, then the response was too lax. The course of the pandemic also has its own dynamics. Those first few months are hell. You are partly in the dark. Everyone wants information, which is hardly available. At the same time, people welcome measures to deal with the pandemic. In the beginning, applause sounds and songs of praise are sung. But it never ends that way. The moment you are applauded, the knives of the guillotine are also already being sharpened. It never ends elegantly."

Against racism and xenophobia

For Van Ranst, informing and educating has always been an inseparable part of his profession. "I'm quite proud of that", he says. Earlier in his career, he received the Career Prize in Science Communication from the Royal Flemish Academy of Belgium. He also wrote a number of children's books about viruses and vaccination that are doing well. They have now been translated in eight countries, most recently in South Korea. Van Ranst has also been a regular and welcome guest on television and in the media for many years, informing and interpreting when it comes to viruses, vaccines, health and disease.

In doing so, he also lets his human and social character speak. Because as far as he is concerned, a virologist does not have to stick to viruses. On the contrary. "I have - even when there was no social media - always spoken out against racism and xenophobia. Always. And very consistently. Also during the pandemic. In Belgium, a quarter of the population votes far-right. Which is not to say they are all racists. But at least that they don't mind racism, otherwise they wouldn't vote for it. You may, no, you should take a stand against that. You don't have to be a virologist to do so. That is just as much the role of the piano tuner, the cop and the high school teacher. It's just part of what you stand for as a human being. People have never been able to convince me not to do it. This has probably also created 'antibodies' in people who disagree, and this, I accept."

I have always spoken out against racism and xenophobia

Keep calling out fake news and nonsense

They were very vicious and even life-threatening “antibodies” that developed in some people during the covid pandemic. Take the threat by Belgian soldier Jürgen Conings. On May 17, 2021, he stole heavy weapons from the barracks in Leopoldsborg and later that day posted himself near Van Ranst’s home for several hours. The virologist and his family were housed in a safehouse where they stayed for weeks until Conings was found lifeless near Maasmechelen on June 20. Take dance teacher Willem Engel and several others who filed lawsuits and whose followers bombarded Van Ranst via social media with conspiracy theories, false accusations and threats. Van Ranst won all five lawsuits filed against him, but it was a hefty drain on his time and belief in fairly debating opponents. After that, social media just continued to facilitate the continuous stream of mostly anonymous slurs and attacks. Continuing to respond to them is exhausting, but Van Ranst won’t let it slide.

“You have to keep speaking up against them! Otherwise, people get the idea that fake news spreaders are the majority, and that they’re right. That’s also why it is not wise to debate them at Op1, for example. That’s not a measured debate. The viewer quickly thinks that the truth will lie somewhere in the middle, but it is not in the middle! Not at all! That’s why you do have

to respond on social media, because otherwise you give your entire social media field to “the wappies” [*sometimes referred to as ‘Covidiot’s’, Ed.*]. And by wappies, I do not mean the doubting citizens, nor the unvaccinated ones. Wappies are those who spread nonsense. If nonsense is just that, you should name it that way. For those who doubt, you have to continue to point out and name that nonsense. But those who are determined, you’ll never persuade. To them, it has become a religion. Just try and make someone change their belief system, it’s a nearly impossible process.”

Vaccinating against nonsense

Is there a vaccine against blatant nonsense and conspiracy theories?

“Yes there is! That’s what we call education! If we explain the scientific method more in schools, people would better understand that there is such a thing as advancing insight. That is completely gone. Politicians know that phenomenon well. When they change their mind once, they are wind vanes, they have no backbone, they are unreliable. People are bullish on politicians. Whereas scientists are professional mind-changers. If new data comes along, you adjust your ideas accordingly. That is very poorly understood and we could explain that better. Also the understanding of numbers and statistics is often poorly developed. So it is both about being unnumerate and illiterate.

Radboud University on the awarding of the honorary doctorate: Marc Van Ranst gained international fame during the COVID-19 pandemic, during which he was one of the Belgian government's key advisors. In addition to his scientific work, he tirelessly interprets current events, through social media and newspapers, on radio and TV. Van Ranst deserves the honorary doctorate because of his courageous role in propagating science-based advice and positions during the corona crisis. This makes him an important example of a committed scientist who has a "significant impact. He is a figurehead for science. His courage is evident in his boldness, steadfastness and perseverance, even despite threats and fierce criticism from corona skeptics.

In Belgium, deteriorating reading skills are a hot topic. If people develop less reading skills, it is easier to start reading things that are not there, you are more likely to fall prey to anyone who gives an explanation that seems attractive. People begin to believe that there are alternative truths. This is very dangerous, because the online world is not separate from the physical world. The day after Conings stood in front of my house, you got groups on Facebook and Telegram of more than 50,000 people who supported him and thought he was a folk hero and praised his goal - to kill me. 50,000 people endorsing that it should be done! That surprised me immensely and it moved me. As long as you have enough people whose heads are being talked mad, eventually there may be one who wants to do a 'good deed'. Who is going to shoot a gynaecologist in front of the abortion clinic. Individuals and political parties that promote such things and call for tribunals and massacres are not without responsibility."

Support from a broad group of people

The honorary doctorate from Radboud University is his third in the Netherlands, after two from Vrije Universiteit Amsterdam and Leiden University. "Something like this happens to you, but I appreciate it immensely. This also helps my parents tremendously. My father follows everything, reads all those negative things unfortunately, sends me things. Sometimes he thinks the whole world is mad at his son, but it's not. He was a teacher, then an inspector and always very involved with education. I come from a warm family where learning was important. I was taught by my grandparents that ordinary is good enough. My grandfather was a metal worker and when I speak in the media, I aim at him. Not using overly expensive words, he should be able to understand what I am saying.

I am also well aware that this honorary doctorate also stands for a much broader group of people who defend science against fake news and alternative truths. I am

not only talking about virologists like Marion Koopmans and other colleagues in Belgium, the Netherlands and beyond, but also, for example, about science communication and science journalism. I also see the honorary doctorate as a gesture to everyone who tirelessly kept explaining what we knew and what we didn't know and how to interpret it. Moreover, there were people who gained a great deal of knowledge through coursework during the pandemic and made good contributions to the discussion. The role of these citizen scientists should not be underestimated. At all these levels, antidotes to the nonsense have been brewing. So yes, I very much appreciate this honorary doctorate. I appreciate it as support for my parents and support from the scientific community. It's good to experience that it does exist on a broad front."



You don't have to be a virologist to take a stand, it's just something you stand for as a human being.

Finding the way through the data jungle

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As our world is digitizing at a rapid pace and data is everywhere, our society faces a huge wave of bits and bytes, containing information about you, me and the world around us. How can we stay in charge of our information? We asked three AI experts, about the impact of Artificial Intelligence as a tool to oversee complex data streams and the opportunities of deploying it for better and more reliable data within our society.

Introducing:



Stijn Hoppenbrouwers
Lecturer HAN
University of
Applied Sciences



Gerard Schouten
Professor moral
design strategy at
Fontys University
of Applied Sciences



Wouter Teeuw
Lector Ambient
Intelligence at
Saxion University
of Applied Sciences

Hoppenbrouwers: “We are dealing with a growing amount of data, so there are also shifts in how to deal with it”, “In two ways, the availability and quality of data are hugely important. The whole digitalization from A to Z depends entirely on data. Too often it is assumed that the data will be fine and that you can do with it whatever you want. It isn’t. If it’s not there or is inaccurate, you have to stop. The data has to be right first. that’s why we started DEMAND: Data-Engineering and Management in Data chains.”

Making data more mature

Schouten: “AI has been making daily headlines lately. Large companies are energetically tackling implementation, but for small companies it is more difficult to implement AI in a mature way. We aim at improving the ‘data maturity’ of companies and governments. A lot of research focuses on social issues or improving processes at companies. but we can really make a difference if we tap into small businesses, connect with students and conduct case studies for companies and government agencies to optimize data use.”

Teeuw: “We do this by putting together a toolbox. Imagine: a city wants to use smart lighting. Data offers us insights as to where and when people drive less or more. The toolbox helps to collect that data, constantly updated through sensors to a cloud platform. This huge amount of data needs to be cleaned up and prepared so that the AI software receives exactly what is needed to make predictions. We are not so much focused on solving the problem with that lighting alone, but we want to streamline the process and implementation of data. and create tools to support small companies in doing so.”

THERE’S ALSO A RISK OF DROWNING IN DATA

When data becomes dangerous

Hoppenbrouwers: “With 10,000 times more data, you can basically do more, but there’s also a risk of drowning in data.”

Schouten: “In the application of data there is still a lot of ignorance; the algorithms are known, but the application is not. This is also mainly about quality aspects. If you want to use data intelligently, before you know it you will create a model that discriminates against certain groups. You have to address this quality aspect. Suppose that you have more men than women as categories, that can cause very strange outcomes. Think of the benefits affair, for example. This algorithm excluded certain groups or made them pay more. There are still large gaps in precisely these quality aspects. By trying this out in practice, we want to tackle and solve this issue. We also want to work on the explainability of models.”

Teeuw: “If you look at that data, there is a technical side and a human side to it. The technical side is the whole flow of data from acquisition to analysis and feedback. How can you get that right? With a smooth flow of data and learning from data and then automating it. On the other hand, you have the people side. Anyone who starts working with data will get advice from AI as from a learning system. Do you trust that too or are you going to do things differently anyway? You can know better and the system can also make mistakes. AI is not always right. You can also make your system’s decisions transparent, so people can trust it. At Saxion, that is a point of focus.”

AI needs people

Hoppenbrouwers: “Many students are interested in AI and decide to pursue an AI-focused degree or master’s program. And they need to, because the field is starved for data-focused experts. But we do notice

that at first, the participants think mainly of apps. It is far from clear to many students how important AI will be for us in the future and why exactly they should choose an AI education. Many beginning students are not yet aware of the whole world of possibilities and activities that data has to offer. To make students more aware of the importance of AI, we desperately need the help of companies. They need to make it clear how important and interesting it is. If the work field itself says that AI is important, students are more eager to this faster.”

WE ARE TRAINING TOO FEW PEOPLE, RATHER THAN TOO MANY

Schouten: “Practically all students find a job immediately after graduation. And I see the demand around AI increasing, so I think we are training too few people rather than too many. We would like to join forces with Fontys and the Technical University about how we can train more people.”

Hoppenbrouwers: “To respond to the popularity of AI and the high demand for data-oriented experts in the market, we are now in the midst of implementing various changes within our offerings. We have a new master’s program as of September 1, 2023; Applied Data Science & AI. In its first year, we already had to create a waiting list for the second class. We are assuming that this will run like crazy. It is a part-time mas-

ter, aimed at working people. We also have a special profile for beta engineering within our HBO ICT master’s programs. At the bachelor level, we have a specialist course. Furthermore, we are teaching students from all kinds of fields to deal with data and implement MAI devices. Think of healthcare, other forms of engineering, business administration and more. All of these fields are looking at what they should and can do with this for their students and research.”

Schouten: “At Fontys, we already offer a lot of AI education, too. Our students can choose from two semesters devoted entirely to AI. We also have a dedicated minor; AI For Society. All students from, for example, the nursing or journalism program can register. Within the minor they work on a practical AI problem. Recently, we also have an applied master’s program called Applied IT. This contains quite a lot of AI. The one-year master’s programme has just started. We are trying to implement AI in various disciplines. Think of the Fontys Paramedical College. They want to do a lot with AI because it changes their practice. This also applies to Fontys Journalism.”

Teeuw: “At Saxion we have the bachelor HBO ICT. This is a broad bachelor mainly about software engineering. However, it does contain specialisations such as big data technologies and business improvement with data. Soon, we

will also start the HBO master’s in ICT: Software Engineering. In this master’s, the emphasis will very much be on data. Furthermore, in 2024 we want to start the new bachelor Applied Data Science & AI in Apeldoorn. We really want to set up a knowledge ecosystem for the Southeast Netherlands. Maybe even for the whole of the Netherlands!”

Hoppenbrouwers: “Eventually, we want to realise a physical data lab, where we can explore and work with all sorts of data intensive activities. We really want to give such a hub a function. What comes naturally then are all kinds of questions about data engineering and data management. We want to use it as an incubator for interdisciplinary projects where we can fully connect with DEMAND for a data foundation. For now, our choice for such a data lab has fallen on the NovioTech Campus in Nijmegen. Here, we will establish our physical lab with the HAN. Initially, this will be about the companies on campus. The lab is a facility supported by the campus as an organization in which all companies are cordially invited to participate. Also organisations outside the campus. For example, the Nijmegen hospital CWZ is also interested in joining what is happening at NovioTech Campus. The same goes for the data lab of Fontys in Eindhoven and Saxion in Deventer. These can also be stand-alone activities that are being expanded, at the initiative of DEMAND.”

DEMAND is a collaboration between Fontys, HAN and Saxion to further already existing cooperation. Hoppenbrouwer, together with Gerard Schouten (lecturer at Fontys University) and Wouter Teeuw (lecturer at Saxion University) is in the lead for the project, aiming to provide new methodologies and tools to oversee complex data streams. The project researches technologies such as algorithms and transformations, as it also looks to build data chains as efficiently as possible. The three main themes within the project are data engineering, data management and AI engineering. The latter is about classifying AI into professional and functioning software.

Plasmacure puts lightning in a plaster

TACKLING CHRONIC WOUNDS WITH COLD PLASMA

“More people die each year from the effects of chronic wounds than from breast and prostate cancer combined”, says Bas Zeper, CTO of Nijmegen-based health tech company Plasmacure. Yet wound healing has received relatively little attention. Perhaps because wound healing is not an independent medical specialty. “We know oncologists, but no woundologists”, he said.

With Plasmacure, Zeper has marketed an innovative, disruptive treatment for wound healing. It involves a type of plastic plaster that is temporarily applied to the wound. With a strong electrical pulse - a lightning bolt - generated in a specially designed device, the air present under that plaster is ionized, creating cold plasma that can stimulate wound healing. Cold plasma consists of charged molecules (ions) that react to their environment and bind very quickly to bacteria, for example. This is exactly what is intended.

TACKLING CHRONIC WOUNDS

Zeper is a business developer pur sang. He learned the trade at Philips, where he researched whether discoveries in the industry could be made into business. After a time as an independent consultant in this field, he wanted to get involved in practical implementation. “Through contact with the Department of Physics and Electrical Engineering at TU Eindhoven, I became enormously excited to start using cold plasma for medical applications”, says Zeper. Not much later, this resulted in the creation of Plasmacure, a company that uses lightning in a plaster to tackle chronic wounds head-on.

Translating an academic idea into a working product is not easy. “You have to jump through a lot of hoops,” says Zeper, “but by now, that’s in the past. Our product is on the market, we have a good business team, and supply hospitals and healthcare facilities.

We are now working on greater recognition for the product and wide acceptance in the healthcare industry. And



Plasmacure's cold plasma pulser

eventually we want health insurance companies to start reimbursing the treatment if it is prescribed by medics.”

HOME TREATMENT

That treatment looks simple. A nurse or caregiver applies the pad and activates it with the small mobile device. Effectively, the treatment takes about two minutes, and the effect is immediate, says Zeper. “A patient with a chronic wound is often visited weekly or twice a week for wound care. This treatment, which you can complete in about five minutes, is easily applicable during home consultations.”

The device that activates the plaster can be rented, purchased or borrowed to experience how it works. Plasmacure supplies the single-use, special cold plasma pads. Zeper: “Patients can currently go to a few hospitals for the treatment. The intention is that the treatments will mainly be carried out by home care organisations.

Device and pads are easily transportable and the patient can be tended to at home, saving a lot of time and travel expenses for both patients and caregivers. It is how we are going to tackle chronic wounds.”



BAS ZEPER
FOUNDER & CTO
PLASMACURE

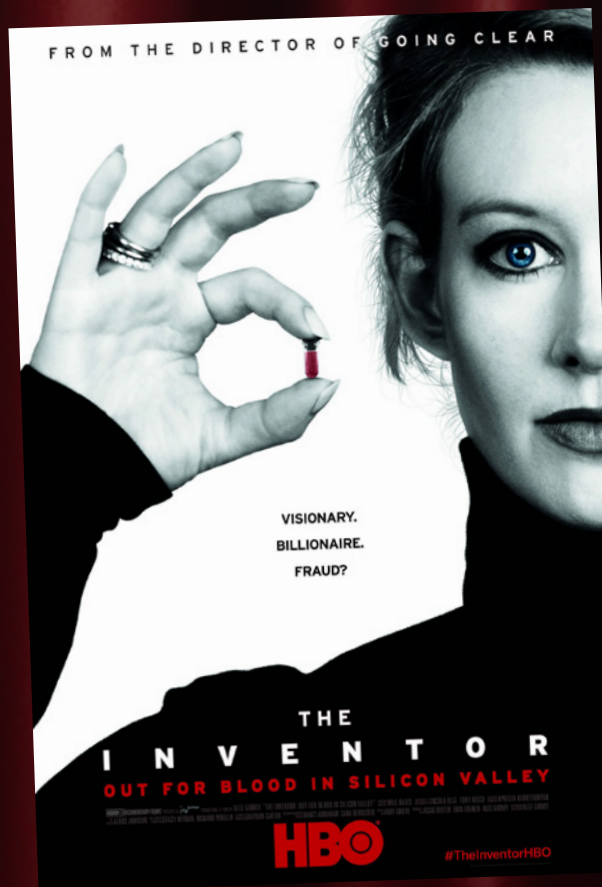
EXPOSED - BY DAISY VAN DE ZANDE

Five film tips in Health & High Tech



Even as a little kid, Daisy van de Zande was already fond of stories, often with her nose in books, or marvelling over the magic of films. "The idea of storytelling has always fascinated me." We meet with Daisy, now festival director of InScience - International Science Film Festival Nijmegen, as she takes us on her journey through the world of science, art, and culture with five InScience films that impacted her.

“Stories are the foundation of our culture. They tell us who we are and how we experience the world. It’s the ultimate way to engage in conversation. And stories can be a great means for scientists to explain what they are doing. But stories are not only important for scientists. Stories are also an important playground for the public to engage with science in an approachable manner. They shape opinions, inspire you, and guide you into the world of science. That’s why bringing the cultural field and academia together is so important. Science is often seen as detached from the rest of the world, but research topic choices are often determined by the culture in which scientists operate. This is why it is so important for scientists to engage with society. Because it’s literally where their ideas come from.”



Tip 1. The Inventor: Out for Blood in Silicon Valley

“My first film tip is ‘The Inventor: Out for Blood in Silicon Valley’. It highlights the delicate balance between innovation and ethics, telling the story of Elizabeth Holmes as a stark reminder of the consequences when ambition gets out of hand. Films like these allow innovators to imagine what the world would look like if their innovations were being used. Suppose you can literally see it all playing out in front of you. On a screen. That is so important. It can cause emotional reactions and make you wonder: are we doing something good here? This emotional involvement is so important because putting scientific knowledge to use is more than anything else a matter of morality.”



Tip 2. Cyborgs Among Us

“Films anchor our common cultural heritage and shape our collective consciousness, weaving tapestries of understanding and perception. Films like ‘Cyborgs Among Us’ exemplify this; while on the surface it’s about technological evolution, deeper layers reflect on our adaptability and the porous boundaries between man and machine. Neil Harbisson’s transformation from a colour-blind human to the world’s first recognised cyborg isn’t just a personal journey. It reflects wider societal changes and underlines the adaptability of the human spirit in our technology-driven age.”

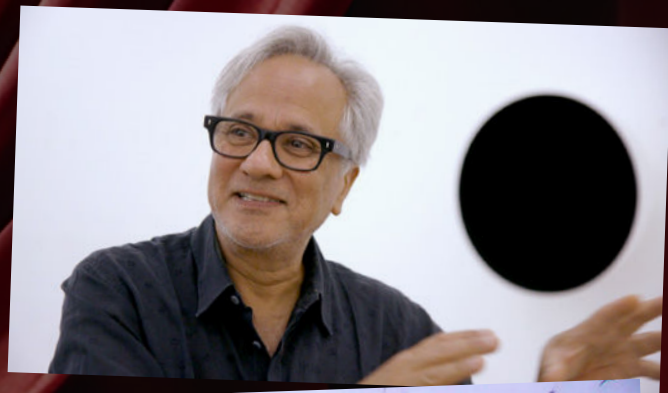


Tip 3. Ich bin dein Mensch

“My academic sojourn at the University of Amsterdam, where I obtained my degree in Media and Culture and my master’s degree in Film Studies, was transformative. As I matured and ventured deeper into intersections of culture, art, and science, I encountered films that portrayed the complexities of the real world. For me, films became bridges to understanding broader social dynamics and the intricate interplay of human nature.”

“This brings me to my third film recommendation: ‘Ich bin dein Mensch’. It’s a delightful, funny and slightly disturbing feature film about falling in love with a perfectly programmed robot. It is a kind of investigation into human relationships, which are increasingly mediated by technology. How is technology changing our love lives? And our social relationships? This film shows that technology secretly plays a bigger role in our daily lives than we think.”

**WHAT KIND OF
WORLD DO WE WANT
TO BUILD TOGETHER?**



Tip 4. Are you there?

“Intellectual critical thinking and research are essentially where the worlds of filmmakers and scientists can meet. A filmmaker also does a lot of preliminary research. But a filmmaker is concerned with the story reaching the audience, whilst the scientist has a paper as the result. So, the filmmaker can sometimes function as a mediator between the scientist and the audience. Getting these three groups on an equal level and having a conversation about the role of science in society: that’s what InScience is about. We provide a platform for a pleasant exchange of scientific ideas. Inspiration and wonderment are particularly important here, as we celebrate interdisciplinary dialogue and shared discovery.”

“A film that embodies this mission and reflects my personal ethos is: ‘Are you there?’ by Dutch filmmaker Maartje Nevejan. Working with neuroscientists, artists, and philosophers, she explores what someone with absence epilepsy experiences when they have an epileptic seizure. She has artists depict what it looks like visually, to ‘not be there for a while’. What happens to someone physically and cognitively? This film explores a phenomenon in a very artistic way that also helps science. This film is even used as training material for health professionals.”



CRITICAL THINKING, RESEARCH, AND IMAGINATION ARE ESSENTIALLY WHERE THE WORLDS OF FILMMAKERS AND SCIENTISTS MEET

Tip 5. The Farthest

“Science is so much more than a sterile field, it’s about drive, the dreams and the human stories that drive great scientific endeavours. A great film knows to capture this energy, as it touches you both intellectually and emotionally. It really takes you into the story of what it is like to be a scientist and how important it is for something to succeed. It can make changes in behaviour.”

“‘The Farthest’ does just that, drawing you into the story by showing audiences there’s more to science than meets the eye. The successes and challenges of the Voyager 1 and Voyager 2 projects are portrayed powerfully. It is not just about rational solutions but also about emotional involvement and the power of imagination. You see how scientists are involved in their work. It takes more than you think to get a project like this off the ground.”

THE STORY OF INSCIENCE

At its core, InScience aspires to be a beacon of shared storytelling. More than just rolling films, they aim to spark conversation, foster understanding, and champion the vibrant mix of science, art, and culture. InScience aims to shape an enlightened, connected future through these immersive stories, celebrating shared stories and discoveries that bridge gaps and transcend boundaries. Also, the focus on science and its place in our society has increased dramatically in recent years. Due to social issues like the covid pandemic, the wall between the scientific world and society is slowly crumbling.

The festival’s heart is situated at LUX in Nijmegen, the biggest arthouse in Europe. A stage where film, debate and theatre come together. InScience is intricately connected to knowledge institutions, educational institutions and the innovative business community, leading institutes doing research in many fields. That collaboration creates magic. Together, they ensure that InScience can provide a stage for science, art, and culture. For the public and for the many opportunities science can offer.

More about InScience, upcoming programs and the next festival:

WWW.INSCIENCEFESTIVAL.NL

AI's revolutionary impact on lung cancer

In the rapidly evolving world of health and high tech, not a day goes by without an innovation that promises to revolutionise patient care and treatment. One of these innovations is Eva van Rikxoort's. The CEO of Thirona successfully made the leap from a scientist to a business leader, all while sticking to her roots in Artificial Intelligence (AI). Eva takes us along on her unique journey and tells us everything about the transformative role of AI in the treatment of lung diseases, and her vision for the future.

You've had quite the journey from being a scientist to becoming a CEO. What triggered this transition?

"Well, the move from scientist to CEO is not a transition I ever expected to make. As long as I can remember, I have been interested in technology. This led me to study AI. After completing my MSc, I studied for a PhD in medical image analysis and found myself fascinated by lung imaging. I began to notice a distressing trend: we have incredible scientific advantages, but these advantages are not available to the patients. That's how an idea started to grow: science should benefit all people. I knew I had to step out of my 'lab coat', into the business world to make a difference."

So, what happened next?

"In 2014, I had a solid scientific career in both the US and the Netherlands,

specialising in AI-based pulmonary image analysis. Logically, at scientific conferences, I frequently ran into physicians and people from the clinical industry, asking if they could use the automatic analysis that we developed. Unfortunately, my answer usually had to be a 'no'. It wasn't just that the solution wasn't market-ready yet. As scientists, it just wasn't our role to commercialise it. This constant need to bridge the gap between scientific progress and its applications eventually drove me to found Thirona. My goal is simple: to bring the benefits of scientific breakthroughs to patients, who should benefit from the knowledge too."

"Lungs are very complex and difficult to examine. You can't just take out a lung to investigate. That's where AI comes into the picture. Lung imaging is in fact the only accessible tool. But its full potential



Eva van Rikxoort
Founder & CEO Thirona

“I had to step out of my lab coat and into the business world to make a difference.”

is still to be uncovered. I realised that AI gave way to new possibilities. Solutions that hadn't yet reached either patients or the medical industry.”

You started Thirona rather than joining another company. What made you choose this path?

“I actually get this question quite a lot. The answer is simple. It just happened. In the US, I worked with an academic group collaborating in a clinical research organisation (CRO) on amazing innovations in our field. The turning point was when I received a request for analysis from a prospective customer, which was in fact one of the largest US research studies on COPD. That was the beginning of Thirona.”

“Ever since, the journey has been filled with learning, growth, and immense satisfaction. I started with just a parttime help and now are with a group of 60 employees. Everything we achieved is because of our belief in what we do, hard work and learning on the go.”

Thirona specializes in a treatment approach rather than diagnostics. Can you explain why?

“We primarily focus on analysing chest images in the context of lung diseases, using AI technology. While our software enables diagnosis and treatment planning for a wide range of diseases, we focus on working together with pharmaceutical and MedTech companies on development of innovative treatment and interventional solutions for both common and rare diseases. Most of our technology ends up in hospitals, powering clinical tools used by physicians, helping them in personalising patient treatment and precisely monitor results.

What does the future of AI look like in your eyes?

“I'm a firm believer in the benefits of AI for the humanity, especially in the field of precision medicine. Thirona combines the ‘magic’ of technology with the most recent research in medical imaging to make a positive impact on society. In the coming years, I reckon we'll see healthcare transform in ways we can't even imagine. Actually, our technology is already being used in hospitals in USA, Europe and

around the world for virtual bronchoscopies, treatment of cystic fibrosis or lung surgeries with virtual reality-based applications, and it is just a beginning what AI can do in imaging.”

Recent developments at Thirona have attracted a lot of attention, including significant investment. Can you shed some light on this?

“In September 2023, we celebrated a major milestone when Thirona secured an investment of €7.5 million, including contributions from HERAN Partners, the Borski Fund and a significant grant from the European Innovation Council (EIC). This investment not only demonstrates confidence in Thirona's innovative approach to precision medicine, but also paves the way for us to continue redefining the possibilities of AI-based medical imaging. We're ready to accelerate our progress and ensure that personalised treatments become a tangible reality for lung patients worldwide.

Finally, what are your goals for the future?

“At Thirona, we're all about our mission and working together. Our passion, and our ongoing quest to explore the uncharted territories – they're still alive and kicking. Our mission is clear: bring the latest scientific discoveries right to the clinics, ensuring more people around the globe have access to the best possible healthcare and eliminating the bias of applying the same treatment approach for every patient.”

“We are convinced that real, groundbreaking innovations only happen when we team up with technological and industrial partners, clinical care specialists, and research groups. One thing that always brings a smile to my face? Seeing our employees grow individually and as a team, and being proud of what we do. The real magic happens when we join forces and co-create. Our ‘partnership and innovation’ mindset truly sets us apart.”

“My goal is to bring the benefits of scientific breakthroughs to patients.”

GROWING GREEN

Piet Oudolf

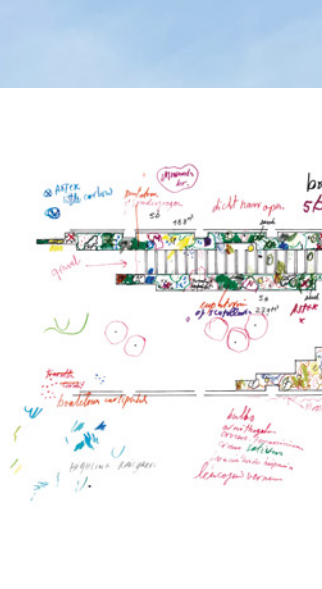
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“Can we
unleash a new
green wave?”

Cities and societies worldwide increasingly look at nature as a source of intelligence, health and inspiration. In the 1980s, the famous Dutch landscape designer Piet Oudolf was one of the first to envision a new way of gardening and landscape architecture in the public domain. In symbiosis with nature and attuned to ecology he created healthy and sustainable plant communities. Today, his planting designs are celebrated worldwide, from the High Line in New York City to the gardens of restaurant Noma in Copenhagen - and recently he was awarded the Elizabeth Medal of Honour by Prince Charles. We asked Oudolf, nowadays also dedicated to inspiring and guiding the next generation of landscape architects, about the impact of his work, what we can learn from the world of plants and how we can unleash a new green wave of innovation worldwide.



Piet Oudolf



High Line, New York

“I want my landscapes to make people feel something. I hope my designs touch them.”

“Back in the 70s, I started working in the family business”, Oudolf tells us. “But even as a kid, I knew I didn’t want to end up in the catering industry, like my family, so I started searching for something else. After taking on a couple of odd jobs and through various experiences, I ended up working in a garden centre. That’s where I – almost literally – got in touch with plants, which sparked a fire in me. I loved it and decided to stick around.”

From the very beginning, Oudolf wanted to bring something new to the scene of gardening and landscape architecture. “Back then, there was a completely different view upon plants from today’s views. The English, classical style of gardening was leading, which was very strict and all about rules to keep your garden under control. However, I felt like there was a need for more spontaneity and originality in our gardens – which to me meant, to use other plants than those which were considered ‘normal’. I wanted to redefine the ‘beauty’ of plants. Not only look at its colors or the amount of maintenance, but also its decay, character or the way it behaves under certain conditions.”

Letting go of control

“It hasn’t always been easy. Because, when we got started, it was different from what people expected.” This often led to questions, and especially in the early days, to concessions on Oudolf’s part. “Sometimes I had to choose whether I wanted to make a buck and be able to pay my mortgage, or create something I truly believed in. But I always had a pretty strong sense about what I wanted and there always was a certain amount of attention which gave me the reassurance that I was on the

right path and should keep moving forward in the direction I was going.”

“It was also really helpful that I wasn’t on this journey by myself. There have always been others who shared my vision and ideas, like-minded people who were on the same level as I was.” Together with Henk Gerritsen, Rob Leopold and Ton ter Linden, Oudolf was part of a movement called the New Perennial Movement, or ‘The Dutch Wave’. “We wanted to renew the status quo and envisioned a more natural and looser way of gardening. Instead of going against nature, it was our source of inspiration. And we started working together with the environment and ecology, taking into account the quality of the soil, microclimates and its position towards the sun.”

Plants are like people, and vice versa

Through knowledge and know-how about plants, Oudolf and the New Dutch Wave were able to disrupt the classical ways of gardening, setting in motion a wave of innovation and growth. “Nowadays, it’s almost considered normal to grow wilder gardens, letting go of overblown flowers and embrace the ways of nature. But when we started this way of designing and shaping gardens, we had to seriously research plants, their characters and the way they behaved among each other in order to learn and show there was a way of gardening that could be better and more successful – both to people and plants. “

“For instance, we learned that plants, just like human societies, live in communities. We investigated their behaviour, and especially the way



**“Instead of working against nature,
it is our source of inspiration.”**



Hauser & Wirth Art Gallery, London

they interact and collaborate with each other. We used that information to build healthier communities, without sacrificing the way they looked or its beauty. Through this knowledge, we designed gardens which lasted longer and, instead of tearing down, they grew more beautifully and successfully over the years. This brought a lot of joy to us, as designers, and to our clients and the garden's caretakers."

The meaning of green

Animals, plants, trees and even micro-organisms: biodiversity and nature are reclaiming an increasing share in our cities, societies and communities worldwide. Although to some the tendency is still moving at too little a pace, awareness raises about the beneficial effects of nature on our health and wellbeing, and governments and corporates are beginning to sense the urgency of applying more green in the designs of our cities' live and work environments. "That's what our garden designs have always been about. I believe – and it has been shown by research - that a garden and plants, like many forms of nature, can have an added value to the wellbeing and health of people both physically and mentally. A garden is a living force, capable of giving you some kind of feeling, where you can maybe experience a certain sense of harmony. It's a form of art, which can have an emotional impact on you."

"We wanted to disrupt the status quo and redefine the beauty of plants."

With his gardens and landscapes in the public domain, Oudolf hopes to involve people in the world of plants. "Now more than ever we need to restore our connection with nature. Working with plants has always had a huge impact on me. I have always felt a strong need to work with plants, and to express myself at the same time, artistically. A garden offers me the opportunity to do both. This has provided me with so many insights and a sense of understanding, about the world around me but also about myself. I want to share this with the next generation – not only everything I know about plants, but also the beauty of it."

The future of plants - and Piet

Currently, Oudolf is dedicated to guiding a new generation to take the next step in the world of horticulture. "People easily forget working with plants is very complex and having the right knowledge is key to creating a successful and healthy plant ecosystem. Over the years, I learned how important it is to have and work with the right information. Having the right people, work with

"Working with plants has provided me with many insights, about myself and about the world around me."

the right knowledge, in the right context – that's where we can really make a difference and explore what the future of plants could look like."

"To be fair, I wouldn't know what the next movement in horticulture and landscape architecture will be." Will it be about letting go of control even further, moving more and more towards nature? Or will it be about technology? "Gardening and nature have always been two separate things, separated by the amount of control we keep as humans. I do think that we should do everything in our power to re-connect with nature as humans. Less control in gardens and the public domain might bring the two more together, but isn't it too late for that already?"

"The future of plants is defined by our knowledge about them"

"Surely, technology plays a practical role, like for instance in watering systems, but I don't believe this is where the next big thing will spring from. Horticulture and plants are and always have been a human affair, so naturally the future green wave will have to come from the next generation of landscape architects."

Book tip

In his latest book, Piet Oudolf shares the work, vision and ideas that evolved from and throughout his career in horticulture. An ode to the place where it all began and which he still calls his home: Hummelo. Available in English and Dutch at bookshops and online.



The changing face of

semi- conductors

Nexperia has been on the rise for decades, but they've been adhering to a new growth strategy since 2019. They used to be a part of Philips, then NXP, and now the company is moving forward with a Chinese investor. "That means a lot to us", explains Charles Smit, managing director at Nexperia. "Although the Chinese influence on the global chip market is a sensitive subject, it enables us to invest in our people, expand our production capacity, and make new expansion plans. In the last five years, we've grown enormously: our turnover has doubled, and we're employing over 500 people in our headoffices in Nijmegen alone."

Nexperia is a global semiconductor company with more than 15,000 employees in Europe, Asia and the United States. They're a leading company in the development and production of semiconductors that enable the basic functionality of virtually every electronic design in the world – from cars to smartphones and consumer applications, with more than 100 billion products shipped annually. Current trends are important to Nexperia's growth, Charles explains. "We understand our role in shaping the future of sustainable technology and the impact our business has on society and the environment. For example, our products enable our customers to develop energy-efficient solutions."

Challenges of growth

Achieving rapid growth takes effort. "In 2019, we had to invest in product innovation and new markets for long-term growth. How do you find out which investments are best? We're still learning. We've created two new business units with people from other companies, which has helped us learn an awful lot. There's a general feeling that anything that has to do with China is dangerous. Because we have a Chinese owner, we often hear that we're automatically working for the Chinese state. That is not true. It's just a successful entrepreneur making commercially viable decisions. Besides, our head office is in the Netherlands, and we abide by Dutch law."

Still, Charles wants to be very clear on the matter: "Having a Chinese owner is still a challenge in these geopolitical times, but we believe the benefits far outweigh the disadvantages. If we had stayed with NXP, we wouldn't have been able to develop as we have. The growth we've experienced, the increase in R&D investment and the desire to invest in a new building in Nijmegen or in our employees – we wouldn't have been able to do it otherwise."

"Of course, the new collaboration was difficult initially, especially since the transition took place at the beginning of the covid pandemic. This is exactly the time when a personal connection is most important, but this was not possible. However, by asking the right questions and providing each other with evidence, we got off to a flying start. Our key figures paint a clear picture of a successful company that is increasing its presence in Nijmegen and in the Netherlands in the long term. We are very transparent and are happy to explain and show our stakeholders how we work."

Big ambitions

As one of the leading Dutch chip manufacturers Nexperia has big ambitions. For example, it wants to invest over 50 million euros in a new building in Nijmegen. "Our current building is gradually becoming too small, so this ambition makes sense. We're prepared to invest heavily in the Noviotech Campus – in consultation with the organisation and the city of Nijmegen, of course."

"There are at least 500 of our chips in every electric car"

Getting young people excited about working for Nexperia is incredibly important for the company's long-term goals. But it's not enough to create enthusiasm: you also need to be known as a good employer. "This reputation is a combination of our image and our approach to job interviews. Nexperia has a long history, but we still act like a start-up from time to time. When it comes to new employees, for example, we're more interested in the people than in a specific profile."

Nexperia Young

Charles explains that new colleagues are given broad responsibilities early on. "We emphasise someone's contribution to the big picture. Our products are hardly visible but they are crucial. There are at least 500 of our chips in every electric car. It would be a shame if our employees didn't realise this and felt that their work amounted to nothing. Our company and our products are essential for the energy transition, for example."

Nexperia has come to the conclusion that the greatest potential lies with the new generation. "That's why we created Nexperia Young, our youth organisation. We're letting them develop new ideas that'll help us appeal to the younger generations – think of the collaboration with the Vierdaagsefeesten or INNOVATE. In short, we continue to invest in our development as a company and as an employer."



Ashley Shih

“I’m a scientist at heart.”

There is a lot going on in the laboratories and clean rooms in the world of health and high tech. In Unpacked, we meet the people behind innovation, research, and technology. This time, we caught up with Ashley Shih - Business Developer at Protinhi Therapeutics - to find out who she is at work and what she likes to do in her spare time. She shares her story and shows us the face of innovation.

“My academic background is in bio-medical science, and now I’m a business developer – quite a difference, because my master’s highly focused on scientific research. During my studies, I spent a lot of time in the lab, which made me realise that this was not the right track for me. I wanted a career that allowed me to interact more with people, and being a business developer allows me to do that.”

“At the moment, Protinhi Therapeutics is a pre-revenue biopharma company, because we are still in the development phase. This means that investment from governments and private investors is essential for the company. So, part of my job is to build and maintain relationships with potential investors and strategic partners. Another part of my job is market research and epidemiological desktop research. This allows me to have scientific discussions with these partners.”

“I do not see myself as a typical businessperson. For one thing, I’m naturally quite emphatic and can sense other people’s intentions in interactions. I’m also a scientist at heart. I have never really cared about sales figures. Instead, I want to facilitate new inventions. I want to use my knowledge of biotechnology to make a positive impact on society. That’s much more important to me than big revenues.”

“I’m an extrovert, so exploring the wonders of our world gives me a lot of energy. This also makes it easy for me to connect with potential business partners. And the technical side of biotech business development also suits me because of my scientific background. This includes translating scientific data to diving into research about the creation of marketing materials, doing market research, and composing project proposals with my science colleagues. I love both roles and being able to switch between them.”

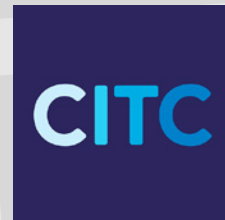
“I love dancing! Not only is it very healthy to exercise, but dancing is a way for me to let go of emotions and celebrate my extroverted side. I also like different types of music, and dancing is an ideal way to enjoy the combination of music and body movement. At the moment, I’m taking lessons in modern dance and ballet. And sometimes, I do hip-hop, K-pop, dancehall, and Latin dance. The only type of dance you won’t find me doing is ballroom dancing, it is not for me. After graduating, I kept my membership at the Radboud Sports Centre, so I continued my dance lessons there. This allows me to get involved with all kinds of dance styles.”

“I’m happy to say that I have chosen a profession that suits my personality and helps me to be myself at work. But more importantly, the people I work with at Protinhi are great. I never feel that I have to be someone else to fit in at work, and that is a great privilege!”



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