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Volume 11
Number 3
June 2017

ΑΤΤΣΗΤΙΣ

Periodical of S.V.A.T. Astatine

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The "ATtentie" is the periodical of S.V.A.T. Astatine, which is issued four times a year. The ATtentie is distributed among members of Astatine, sponsors of Astatine and employees connected to Advanced Technology at the University of Twente.

Volume 11 / Number 3 / Issue 47
Copies: 750
Date of issue: June 1st 2017

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With thanks to
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If you want to contribute to the next ATtentie, you can send in articles via email: attencie@astatine.utwente.nl
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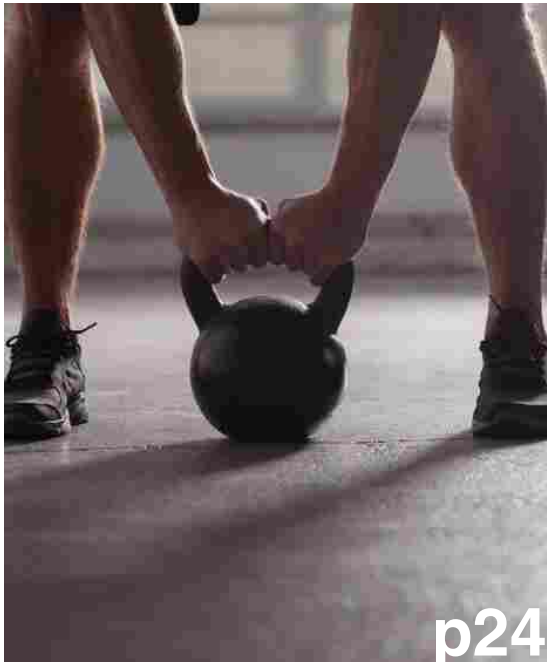


Editorial

Summer is approaching and life is going to happen to you.

You've probably noticed that recently time has been acting strange. Not (necessarily) through substance or theory of relativity but because of the sun. Spring is the process by which work is slowly transformed into vacation. This process is very complex and manifests itself in many ways. One example is the great influx of scattered national holidays. One would almost think that Jesus and his friends kept the seasons in mind while creating their legacy.
Also apparent is the scaling of this phenomenom of relaxation with intensity of sun. I do not wish to diminish the accomplishments of disciplined Southern-Europeans, but let's just say it's quite clear the sun is inviting them to enjoy life.
With liberation day we celebrate the great amount of freedom we have to do what we want, but I'd like to celebrate something more. Embrace not only the parts of your existence which you *can* control but also the parts which you *cannot*. There is great beauty to be found in surprise so let us celebrate the sun and let life happen to us.

Jasper Gerritsen,
Editor in Chief

Astatine

From the Astatine board

Jan Eggenkamp

Warning: the following in an opinion!

What is the goal of life? Most people agree that being happy is the single most important thing. But how do you achieve this? When I look around I feel that most know what makes them happy, but somehow they manage to not do these things. This is something that fascinates me. I always thought that people just do what they want. At least in Western Europe, as we have (more) freedom to do so. There are many factors involved that make people choosing something else. Think about health, money, relationships. Technological developments can improve this greatly. Health science can partly solve the first objection. I am also very curious about the basic income, where you get a minimum amount of money each month and you do not have to do anything for it. I do not see the relationships part being solved, humans are very complex species (are we?) and figuring them out will happen sometime, but far from soon.

I deeply appreciate people when they make decisions that would scare me. Would you quit your study to achieve your goal? I think it is a safe and comfortable way to finish your study, with or without some side projects, then get a job at a company or university and move on in life. I am not adventurous enough to make these huge life decisions to just stop what you are doing. Mainly, because I feel happy with what I am doing. Partly because AT gives us knowledge and structure in the way we work. We also need to be able to make, design, calculate something and to understand how certain phenomena work. This could also be done merely by self-study; the material and internet explanations are often present. Most of us do a lot besides our studies; committees, own projects, sports or even boards. I truly enjoy the entrepreneurial spirit of AT students. There are so many good ideas lying around, of which some get executed. We are good at seeing problems, solving them is way harder.

When encountering problems, we should not become pessimistic about the world. After all, we are the ones who can change it. We can get grumpy later in life, but not now. Now is the time to use our knowledge and change the world. Yes, we must be a bit naïve and idealistic. But if we even give up trying now, what is your goal then? This is what I think is optimism.

Excursion to CERN

Christophe van der Walt & Roos de Vries

Of spinny things, tiny things, and chucklesome nomenclature

To eels, and the hovercrafts that contain them

The European Organization for Nuclear Research, aptly abbreviated to CERN, is world renowned for its premier research in particle physics. Over the last 50 years, this 213 hectare lab has discovered new subatomic particles, new interactions between particles, and new methods of measuring both. Each year during the 7th module of AT, 2nd year students are given the opportunity to visit the campus to learn about the physics and the accelerators developed there. Each year, these students are puzzled by the strange names given to the curiosities which can be observed at CERN.

On the first day of the trip, students were introduced to one of the oldest accelerators on the premises: the synchrocyclotron. This magnificent beast varies its electric field to accelerate an electron around a loop, by synchronising its field with a cycling particle. So, “synchro” and “cyclo” make sense. The end of the word, -tron, stems rather indirectly from the word electron. Any device that accelerates or directs particles can end in tron-- most notably, the Dutch word magnetron. Personally, I believe that scientists gave the device this name because it just sounds really really bad ass. To back up this theory: synchrocyclotron is the longest word in the English dictionary which ends in -tron. BAD ASS.

There are also many other trons to be found at CERN, such as the Super Proton Synchrotron, the Large Electron-Positron Collider, and the Antiproton Decelerator. The function of these devices can be inferred from their names and the explanation above. However, when AT second year Roos de Vries asked experts at CERN why the devices were named the way they were, no one seemed to care about etymology, much to her disappointment. Experts responded: It just sounds majestic.

An over-thinker would be tempted to ask the following question: How did the cult science fiction action adventure film Tron get its name? After all, the movie has little to do with microwaves or particle accelerators. A bit of research reveals that the Tron licence belongs to Disney, which means the most probable answer is marketing. In other words, scientists, Disney and ATers all agree: -tron sounds really cool.

Okay, I’m done tronning. The devices mentioned above all function to spin particles (protons, electrons, muons, gluons, quarks... I’ll get back to this) around really really fast. That said, what is the use of synchronously cycling electrons around if you cannot learn from the situation? The loop a particle cycles through in each experiment is equipped with a variety of detectors. These detectors take careful measurements of the phenomena incited within the loop. The ATLAS detector can note, for example, the position of subatomic particles that cascade away when particle beams collide. The type of cascade tells scientists whether they are observing a normal particle collision, or something more extraordinary, such as, say, the Higgs Boson which was discovered in ATLAS.

So why is the experiment called ATLAS? And why are there also experiments called EAGIS, ALICE, ALPHA, AWAKE, BASE, CAST, CLOUD, COMPASS, DIRAC, ISOLDE, OSQAR, and TOTEM? It seems rather coincidental that all of these experiments would have child-appropriate, easy to pronounce acronyms. Where are the AMS, ASACUSA, ATRAP, CMS, LHCb, LHCf, MOEDAL, NA61/SHINE, NA61, NA64, nTOF, and UA9s one is more likely to expect? Well, all of these acronyms represent experimental setups at CERN (Don’t underestimate the term ‘experimental setup’). But, the point is that an unproportionate amount of these abbreviations are... cute.

These cute names are especially unfitting when you look at what they measure: dark matter (not cute), or antihydrogen (not cute), or hypothetical particles which might exist in the center of the sun (not cute... hot). I did some research into these acronyms, and, just like the synchrocyclotron, some of them have a name which relates to their function. CLOUD, for example, explores the potential link between galactic cosmic rays and cloud formation. Most of the abbreviations, however, have probably just been added to make the devices they represent just a little more graspable. To give an example: you would much rather hear someone say, *It took me years to fix Alice, but I’m glad I did* than *It took me years to renovate the N-A-61/ S-H-I-N-E, but I am glad the job is completed.*

The realm of high energy physics has some very interesting terminology, most likely because the subject delves to a point past reasonable, intuitive imagination. This allows scientists to associate names with somewhat more creativity and less justification than certain other branches of physics. Let us explore one example of this here :

When the model for the composition of hadrons was made in 1964 by Murray Gell-Mann and George Zwieg, a name for such constituents had to be invented. Whereas Zwieg wanted to call these “aces”, Gell-Mann had the obviously superior idea of only suggesting

a pronunciation: something that sounds like "qwork". This seemed to be going nowhere (I wonder why), until Gell-Mann stumbled upon a passage of Finnegan's Wake one day. The passage reads :

--Three quarks for Muster Mark!
Sure he hasn't got much of a bark
And sure any he has it's all beside the mark.

This is quite a nice passage to use, as this describes how quarks appear in threes in nature. As for the pronunciation, while one would think this would mean that, rhyming with "Mark", the word "quark" should then be pronounced as such. However, in James Joyce's novel, the scene is in a bar, so the word "quark" in this passage may in fact be used for the rhyme's sake, instead most probably meaning "quart". This would, if one keeps the same accent on the vowel, justify the pronunciation of "quark" intended by Gell-Mann. For some reason, this is the term that caught on, especially since the discovery of the particles at Stanford in 1968... until you consider the alternate pronunciation of quark, which you pronounce as if it rhymed with "Mark". English is a fickle mistress sometimes.

So, that's how we're all calling them "quarks" today. One might speculate as to the relevance of such a name in the scientific community, but at least the word has an etymology worthy of its importance in the Standard Model and so our understanding of particle physics. This quark-rant of sorts shall now continue by discussing strange quarks.

Back in the 40s and 50s, when scientists were still mainly using cloud chambers to detect particles, they used to detect "strange", heavy v-patterns in their devices. These particles (which we now know as kaons) were formally defined as strange. When the quark model became widely used, it was discovered that this strangeness was in fact caused by a hadron, that, instead of "containing" a down-quark, contained a heavier variant thereupon, which was in turn baptised "strange quark" : the cause of all the strangeness.

To explicitly conclude this amalgamation of words, we saw a lot of abstruse and remarkable things at CERN. We distracted ourselves from the fact that we will probably never understand these things by judging them by their names. But, the point is this: even those who discover new particles or build $4.75 billion Large Hadron Colliders want to give their babies cute names. They are humans, and that makes CERN all the more incredible.

Interview

Interview: James Seddon

Frank Esselink, Yannik Wotte

Can you introduce yourself?
Yes, my name is James Seddon and I'm from Manchester. So I'm born and raised in the UK and I went to university there. I studied a Master degree in physics: I don't know if you have that here anymore but this is a combined Bachelor and Master degree. From that I did my PhD (also in Manchester, so I never really went too far from home). I had to stay near home for personal reasons. At the end of my Master degree I already had a job offer to work for the British government. I was actually offered this at the start of my final year, so that year was really easy for me because I didn't have the stress of finding a job. At the end of my final year my Master project supervisor walked past me and said: "Oh it's our PhD day today, I hope you apply". So I thought "Yeah go on I'll apply for that". I did my PhD there and then, at the end of that, I was offered a job to go to industry. However, then the guy in the next research group down the corridor asked if I'd like to postdoc for him. So, again I said yeah, and I Postdoced at Manchester for a few years. In a nutshell that's it. From Manchester I came here and I've now been at the Twente for eight years. My Dutch is still terrible, my English accent is still terrible, but it's getting better.

What was the subject for your PhD?
My PhD was in condensed matter physics. It was in the group of Andre Geim, the guy who invented graphene. This was before he invented graphene, of course. So I was looking at super fluids: I was interested in looking at convection in super fluids. There are lots of different reasons why convection of super fluids is a little bit different to that in conventional fluids, but the techniques, apart from having a cryostat working at one or two Kelvin, were from standard fluid dynamics. It was mainly about convection in slab geometry and we were interested in the onset of chaos in that system. It happens as in all liquids in the world at a certain critical rating, but with a superfluid it's different. There's a lot of controversy on why that is, we did not solve that I can say! –laughs- There's one group in Trieste still trying to solve it today, so it's still not solved and it's already twelve years later. –laughs- So I don't feel bad about that. It's a very complicated problem. I also don't think it's particularly interesting anymore, in hindsight: I just did it because it was fun. Nowadays it is completely different. Now I think you have a much higher social responsibility on actually solving more socially relevant

problems. In the UK we still have a lot of fundamental PhDs available, in the Netherlands less so. It's a lot more socially responsible.

How did you end up at the University of Twente?

After the PhD I moved to become a fluid dynamics physicist, as a postdoc. And then, at the end of the postdoc, I thought I really like fluid dynamics. So I made a list of people around the world who I thought were the experts. I wrote to all of them: You don't know me but I attached my cv and "You've got nine months to find money enough to pay me", because I needed a job. Of those people three never responded and three responded and said yes. Detlef Lohse did that within twelve hours. So that's actually why I went to Twente: He was first.

I came here to look at little bubbles. My PhD was in condensed matter physics and I became a fluid dynamicist. Now I do fluid dynamics with condensed matter physics techniques. So it kind of fits together nicely. I also saw this opportunity with Nanoionics and I thought "Let's give that a go". That's why I'm here in this group now and I'm very much interested in liquid structure at interfaces. This is relevant for energy storage; this is the selling point you might tell people if you were writing for money –laughs- . It's fundamentally exciting, that's why I do it. And again it's looking at how liquids behave but using experimental techniques from solid state physics again. So this is where I found my niche, I'm very happy here.

How did you get involved with AT?

When I just started working for Detlef I had two offices. One was in physics of fluids in the meander building, the other was in solid state physics in the group of Bene Poelsema in Hogekamp, back when the building and the solid state physics group still existed. I sat in an office with Harold Zandvliet for the first couple of years. Herbert Wormeester was also embedded in that group, so I knew him already. I can't remember whether I asked him or he asked me to get involved with AT. But I was looking to do more with teaching because I wanted to try some things out for which I needed more access to students. I was already teaching classical mechanics to the physicists, and dynamics is not that far from classical mechanics. So it was the obvious logical place to put me.

Which module are you involved in?

The module is Dynamical Systems (They used to call it Advanced Engineering). And now what we teach: There is a wonderful project in AT module 4. You design, build and test an accelerometer, and the module has changed a lot since I took over, that's for sure. It's now much more geared towards the project itself. When I took over it was a flat structure. Nevertheless I think the ratings of the module went from the lowest rated to the highest rated module when I took over last year. I was very happy about that and that was I think just because of better communication with the students.

This year we've changed it completely, structurally, and I think the students are going to like it. The students are only a week in and pretty much every feedback was positive already. Actually, I always take an accelerometer off my belt in the first lecture, from Fitbit. It didn't exist as a company five or six years ago and now they're worth billions. I think there's no reason why it can't be an AT student making this, right?

What are your hobbies?

Oh my hobby's, oh gosh. Apart from my two cats, which are my life, I have a wife as well. She's obviously part of my life, but not as much as the cats. Bagheera Singh, also known as Booboo, and Kiiki Dee, also known as Kiiki: These are my babies. –laughs- That's where most of my energy goes into. Other than this I spend a lot of time in the garden. I'm vegetarian, so is my wife, and we try and grow as much of our food as possible, organically, no genetic modification, no chemicals etc. We try and do that and I get a lot of pleasure out of that. The third hobby would be hiking, and I spend a lot of time in the UK doing this. When I first came to the Netherlands I was travelling back thirteen times a year to the UK. Lake District, Peak District, you name it. So I try to go hiking as much as possible and my wife likes this as well. So: hiking, gardening, cats. The cats take up most of the time.

Why did you choose for the academics instead of a company?

This is an interesting question; it's one I think about a lot. Why academia? Well money is one thing: I don't need to be rich. I just want to be rich enough that I'm happy, and that doesn't need a lot of money. But being the first person to see a data point, being the first person to get the realization, no one in the world knows this, we are the only people who know this right now. The buzz from that outweighs everything else, which makes me very happy.

Most academics normally prefer research or teaching. I am actually very lucky that I love doing research, but also teaching. I like to try different things out and to see what makes the students click. So I get a lot of pleasure out of both of these aspects of my job.

What I want to say is: If you want to work in industry, don't do a PhD, unless industry requires it like is very often the case in chemistry. The reason I say this is because you have a lot of freedom in academia.

We don't get paid very high, but we get a lot of vacation to compensate that and there are a few niceties in this respect. But we can choose what research we're doing. If you work in a company, you may be so close to a breakthrough, but tomorrow you may be told to stop, due to corporate strategic realignment. If you have done a PhD you'll have had the freedom to push ideas as far as you want, so for someone else then to be in control to take it off of you: I think it's heartbreaking. So if you want to go to industry, don't do a PhD. –laughs-

Who is your favorite scientist and why?

That's a good question. It's going to be someone who I've worked with. Well, I'm going to say two names. First: Douglas Osheroff. I met Doug maybe thirteen or fourteen years ago. I had never heard of him and you've probably never heard of him. I stood in this hall drinking Sake at this conference and this person was looking over my shoulder and saying "There's Doug Osheroff!". I said "Who?" - the person repeated "There's Doug Osheroff!". I said "Who is Doug Osheroff?" and he tapped me on my shoulder and took my hand and said "Hi, I'm Doug Osheroff, let me sign something." We had these wooden Sake cups and then he signed the bottom of the cup. I had no idea who he was, and I went away. He won a Nobel Prize for discovering superfluids in Helium-3. Afterwards, I bumped into him at several conferences and it is his pure honesty, which I admire. He was giving a presentation and someone in the audience said: "What do you think about the present idea of putting men on Mars?" And Doug Osheroff answered: "At least it makes the space station look cheap." And from this on I was like "Yeah, this is just pure honesty, this is a crazy idea and he knows it and everyone knows it, but he's got the balls to say: This is the truth".

In terms of actual science: A guy called Tom Mullin. He was my boss when I was a postdoc in the UK and he is a brilliant scientist and very humble as well. I remember he came to my office crying once. I said what's wrong and he answered "I just published my 77th paper" so I asked "So what?": He then told me that Brooke Benjamin, his boss earlier in life, only published 76, and "Now people are going to think I'm better than him and I'm not". Brooke had like four or five laws named after him so my boss was like I've not got a single one. Just this pure humbling of him as he was a harsh Scottish man. Tom is also brilliant in science. He got me excited for fluid mechanics. But he's just doing really very nice, very strong science, very humbling guy and they don't make them like him anymore: He was one of a kind.

Alumni

California Dreaming

Yorick Birkhölzer

While the world was looking forward to the first female president of the United States, I worked as a visiting student researcher at Stanford University in the heart of Silicon Valley in California. My name is Yorick Birkhölzer and I currently work on my Master thesis assignment in the Inorganic Materials Science group.

I graduated from AT in the summer of 2015 and stayed at the UT to follow the master program Nanotechnology. To tell you the full story, that master program was the very reason I came to the UT in 2012 in the first place. I already knew in High School that I wanted to study Nanotechnology and since the MESA+ Nanolab just opened when I first visited the UT campus in 2010, I was immediately attracted to this University. I browsed through some study guides to find out which Bachelor would prepare me best for Nanotechnology, and that's how I found AT. It was also an important argument for me that the study was offered in English, as by then my Dutch wasn't so great yet. Materials Science attracted me from early on, though I actually never enjoyed Chemistry classes in High School. initially, I also considered the study programs of Applied Physics and Electrical Engineering, but I never regretted my study choice. AT gave me a broad background in science and engineering and that's exactly what I came here for.

Most Astatine members know me very well since I have been teaching for AT from 2013 – 2016 where I helped to shape the curriculum of the first-year study program

together with my friend and mentor Ruud van Damme. Furthermore, I participated in three BuCom trips (England, Germany/Czech Republic and Denmark/Sweden) and I was one of the supervisors during the 2015 & 2016 CERN excursions. I was once called the most active inactive member of Astatine since I participated in so many different activities, but officially never joined a single Astatine committee.
If you are currently a first-year AT student, you haven't had any classes with me and that is because I spent half a year as a visiting student researcher at Stanford. So how did I end up there?

I knew that I wanted to go to California for my research internship since I had once gone to High School in San Diego as an exchange student and I immediately fell in love with the state. The internship is an integral part of the master program Nanotechnology and a perfect opportunity to make new contacts in the academic world. I asked professor Gertjan Koster for advice, whom I knew from various courses in AT, my BSc assignment in the IMS group, and the first year of my Master. Gertjan kindly arranged the opportunity for me to apply for a visiting student researcher position at the Geballe Laboratory for Advanced Materials (GLAM) at Stanford University, where he had worked himself from 1999 – 2007. From this period, he has great contacts in the area and he even helped me to find affordable accommodation, which is generally almost impossible to find in Silicon Valley.

Working at Stanford is intense. Everybody is extremely smart and driven, and American workdays are long, very long. Late night and weekend experiments are normal and free days are sparse. Those who want to make it to the top in academia need to be available virtually 24 / 7 and one must check and answer emails as if there is no tomorrow. That's what smartphones are for.

The biggest benefit of working at Stanford is the direct contact with many world class researchers. Literally every day there is at least one fascinating lecture by a world leading expert. These academic guests are flown in from any leading Institute: Harvard, Princeton, MIT, Oxford, Cambridge, Zürich, Weizmann, … you name it. During their stay, these guests are officially hosted by a Stanford faculty member and via him or her it's easy for post docs and grad students to get in contact with the speakers informally.

Besides academic visitors, Stanford is also well known for its excellent ties to industry. Silicon Valley

California Dreaming

tech companies like Intel, Google, and Facebook do almost anything to attract Stanford students. I saw never ending opportunities to attend lunch lectures, visit companies etc.

Living in Silicon Valley is extremely expensive, especially in Palo Alto. I combined three fellowships and still had to bring up a substantial amount of private savings to survive. Well, now you know what I spent the money I earned as a teaching assistant on. To give you an idea: The cheapest bread costs > $ 4 and for the price of a single beer at Stanford I can buy a whole meter of beer at the TAP at the UT. The only thing that is really cheap in the US is gasoline, but in order to benefit from that, you first have to rent a car, which then again isn't particularly cheap either. Luckily, there is a car rental company located directly on campus that offers discounts for Stanford affiliates.

Anyhow, cycling is very popular and convenient at Stanford and so I rode my bike every day. The absence of dedicated cycling lanes forces you to ride on the sidewalk, and the lack of street lights forces you to wear reflective clothing and buy very strong lamps for your bike. Furthermore, it's totally normal to wear a protective helmet. Literally, everybody does that, no matter how old or young.

Under the supervision of prof. dr. Harold Hwang at GLAM I worked on the fabrication and characterization of freestanding perovskite nanomembranes. If you are interested in the details of this project, I can strongly recommend you to take a look at the very illustrative paper published by our team in Nature Materials in September 2016 [1]. A big part of my work took place at prof. Hwang's second lab at the SLAC National Accelerator Laboratory campus, which is located on top of a hill behind the main campus of Stanford. SLAC is mostly known for its X-ray free electron laser and its synchrotron. At SLAC I had

direct access to a top notch Atomic Force Microscope, which I used to measure the Young's modulus of nanometer thin, freestanding strontium titanate (STO) films. In macroscopic, isotropic bulk samples, the Young's modulus is a material constant and does not depend on the shape of the specimen. My goal, however, was to determine how the Young's modulus of STO depends on film thickness in the extremely thin limit. After months of sample fabrication challenges, we eventually collected some very exciting data. Six months passed and I had to leave the US again to finish my Master in Twente, but my colleagues at Stanford are still working on the project and we will hopefully soon write a publication with our findings.

You probably once heard the saying "it never rains in California". Well, that might have been true for the six terrible years of a devastating drought, but during the last winter, it rained more than enough in northern California. The climate in Palo Alto is normally very pleasant, the temperature seldom falls below 0 degree Celsius in the winter and it doesn't often go above 30 degrees in the summer. Microclimate can differ a lot from town to town though. Half an hour drive to the south of Palo Alto lies the big city of San Jose, the unofficial capital of Silicon Valley, where summer temperatures often go above 40 degrees. Palo Alto is located on the Bay Area Peninsula, about 60 km south of San Francisco. It is one of the most expensive cities in the United States and its residents are amongst the highest educated. More than 40 % of the 66,000 inhabitants have a Master's or Doctorate degree. I lived only a few blocks away from Facebook CEO Mark Zuckerberg and the famous garage where Hewlett-Packard (HP) was founded. Palo Alto served as an incubator for countless high-tech companies such as Google, Facebook, Logitech, Pinterest, PayPal, and Tesla. The area is home to many of the world's largest high-tech corporations and thousands of startups. The silicon-based integrated circuit, the microprocessor, was invented here, which later gave the area its well-known name, Silicon Valley.

California is a beautiful state. Its landscape offers miles of scenic beaches, high mountains with multiple feet of snow, endless highways, fruit and vegetable fields, and of course the southern deserts. I deeply enjoyed to explore that diverse environment and I'm grateful that I got the opportunity to live my Californian dream.
Before I moved to the US, I naively assumed that everybody there would speak English fluently. Sadly, that wasn't the case. So, if I may conclude my article by giving you a well-meant advice: improve your language skills now that you have the time. If you're Dutch and you struggle with English, do something about it before it will one day hinder your career! Life after your Bachelor won't be as relaxed as now anymore so seize all opportunities to travel, join summer schools and take language classes. To the internationals among you: take a Dutch course! Sooner or later, there will come a day where you will terribly regret not having learnt Dutch. From my very own experiences in many different countries, I can tell you that life is more fun if you have at least some basic knowledge of the local language. Let your curiosity and your ambition drive you to new places for an internship or a study abroad. Raise the bar! Finding the right place, program, and financing takes about a year, so start looking today. That having said I hope you enjoy Advanced Technology as much as I did during my time and I wish you all the best for your science and engineering careers.

[1] D. Lu et al., Synthesis of freestanding single-crystal perovskite films and heterostructures by etching of sacrificial water-soluble layers, Nature Materials 15, 1255–1260, 2016, DOI: 10.1038/nmat4749 http://www.nature.com/nmat/journal/v15/n12/abs/nmat4749.html

Batavierenrace
The 45th edition of the Batavierenrace took place on 28 and 29 May in which students relay race from Nijmegen all the way to Enschede. Astatine participated with the name A-team and finished on the glorious place of 199 out of 314 finishing teams. Our team finished the 175 kilomters in just over 16 hours, which gives an average speed of about 11 km/h.

Parents day
On the 7th of april the yearly parents day was organized again. Spaghetti bridges were abundant and the fathers and mothers were shown around some relevant campus spots.

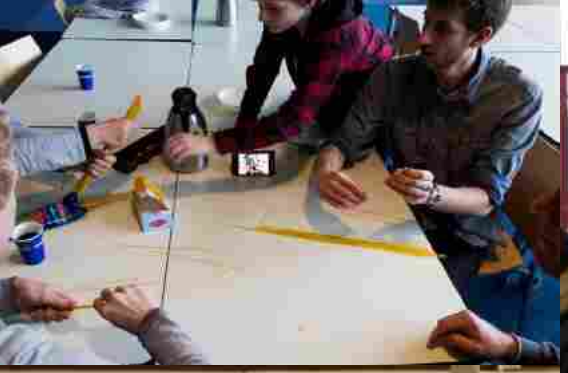
Bucom
This year's trip was to the UK, specifically to Northern England and Scotland. Our friends attended technical companies such as Tata Steel, a very large steel producer and Bede Gaming, which constructs gaming equipment. Next to that the area is known for its abundance of cultural heritage, especially to see literature and architecture you are in the right place.
The trip was in the week of Monday 22 May.

Somewhat recent AT graduates

Jonas Amtsfeld	Inorganic Materials Science (IMS)
Ankit Anand	Energy Materials and Systems (EMS)
Suzanne van den Berg	Inorganic Membranes (IM)
Mel Burger	Production Technology (OPM/PT)
Robin Cornelissen	Mechanical Automation/Demcon
Sylvio van Ditzhuijzen	Production Technology (OPM/PT)
Thomas Ganzeboom	Energy Materials and Systems (EMS)
Moritz Nunnenkamp	Inorganic Materials Science (IMS)
Jasper den Os	Biomechanical Engineering (BME)
Erwin Verkleij	Mechanical Automation (MA)
Chris Wouters	Computer Architecture for Embedded Systems (CAES)
Jelle Zult	Robotics and Mechatronics (RAM)

Sailing weekend
After its great success last year the sailing weekend took place again in Friesland on 6 and 7 May. If you're longing for some old school trip feeling make sure to join next year.

On the 9th of June the Attraxcie organizes a trip to Phantasialand full of adventure, thrill and surprises!











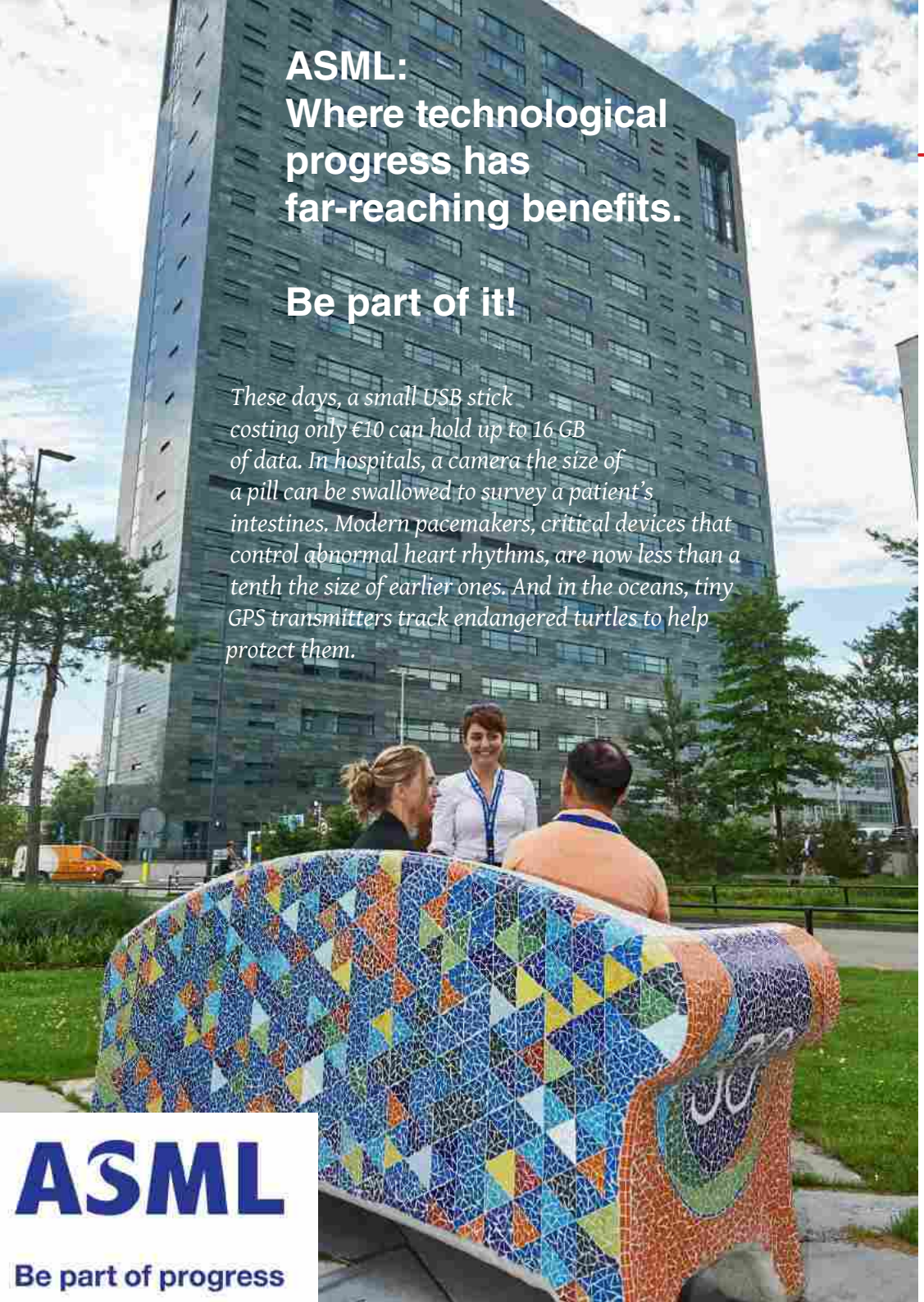








ROSS



While these devices are incredibly small, they represent a big milestone in technological progress. At the heart of each of these life-enhancing innovations is a microchip – a tiny package of integrated circuitry that powers the performance of the device. In a world in which major breakthroughs measure only a few nanometres in size, the constant quest is to produce chips that are smaller, faster, more effective and less expensive. One of the major high-tech players leading the quest is ASML, a manufacturer of lithography systems for producing computer chips.

Crucial step

ASML, located in Veldhoven in The Netherlands, supplies equipment to all the world's major chip manufacturers. These include Samsung, Intel and TSMC.

There are dozens of steps along the path to producing a chip. ASML helps manufacturers take just one of these steps, but it's a very crucial step: lithography. Lithography involves exposing and chemically etching the wafers used to 'print' a chip's components. The more accurate the lithography process is, the smaller the resultant microchip can be.

Using ASML's latest generation of machines, it's possible to print lines on chips that are only about 20 nm thick. To put this into perspective... that's like printing the contents of a 500-page novel onto a centimetre-long strand of human hair!

Opportunities to be part of progress

To continue leading the race to produce smaller, faster, cheaper chips, ASML is looking for people who always want to do better and never give up. People who love what they do – not because it's easy, but because it's hard. People who will help find the best idea, the best solution, the best way forward.

People pushing technology further

The driving force behind ASML's technological breakthroughs is its forward-thinking engineers. ASML's more than 16,000 employees are some of the most creative thinkers in the world of physics, mathematics, chemistry, mechatronics, optics and informatics. And because ASML invests over €1.0 billion annually into Research & Development, these experts have all the resources at their disposal to push progress to the extreme. It's the only way ASML can maintain its edge – worldwide.

A place of learning

ASML is an ideal environment for professional growth and development. The company offers a fulfilling career, not just a job. ASML rewards employees competitively and provides coaching, training and personal career development. Flexibility, enthusiasm, ambition and customer focus are the foundation for a world of opportunity. To find your opportunity, visit *www.workingatasml.com*

CrossFit® - The Good, the Bad, and the Ugly

Jelle Slief

Some love it, some hate it; many simply don't know what it is. Most people have some vague notion of the stereotypes surrounding the sport, but are these really justified? What actually is CrossFit?

Strictly speaking CrossFit is not a sport, it's a "fitness methodology". Ok, so what does that mean? Well, this means that CrossFit strives to get people fit, similar to a gym membership or a yoga class. What makes CrossFit CrossFit, is how it does this, and this is exactly what makes the program so unique. According to the official definition:

"CrossFit is constantly varied functional movements performed at high intensity."

Let's break that statement down.
Firstly, constantly varied means that the movements used in trainings aren't the same ones every single time. CrossFit uses a wide variety of exercises and movements from a range of several different sports, including: Olympic weightlifting, gymnastics, powerlifting, rowing, swimming, running, plyometrics, calisthenics and strongman. Elements from all these different fields are mixed together in workouts to increase strength, speed, agility, stamina, stability and endurance in athletes, to keep training methods effective, and to keep trainings interesting. In doing so, CrossFit seeks to create all-round fit athletes. Not just strong or fast or durable, but all those things at the same time.

Secondly, it says functional movements. This means that the movements done in CrossFit allow the athletes to move large loads over long distances, and to do so quickly. Again we see the different aspects that contribute to a person's overall fitness: strength (large loads), stamina and endurance (large distances), and speed (do so quickly). CrossFit doesn't seek to make athletes simply look good (though it's a nice consequence if you do it right) or make them really good at one particular skill without many real-world application. Instead, the ultimate CrossFit athlete will be able to apply his skills in everyday life, and adapt to diverse physical challenges thrown at him/her at any given time. Perfect examples of this are some of the workouts and challenges top athletes have faced at the CrossFit Games (a sort of CrossFit world-championship): from long and grueling trail runs through treacherous terrain and obstacle course sprints to heavy deadlifts and Olympic weightlifting, workouts involving rope climbs and handstand walks, tire flips, half-marathon rows, swimming and even pegboard ascents. The goal ultimate behind all of this is to prepare for and train to be able to respond to any physical challenge – to create functional and usable fitness.

The third and final part of the definition states that the movements in CrossFit are performed at high intensity. No fitness can be achieved without intensity in a workout. In order to get stronger, muscles need to experience continuous overload (i.e. be under stress, for instance by lifting some heavy weight) over extended periods of time. To create stamina and endurance, hart rate should be elevated for long durations. To get faster, you need to run as fast as you can right now as much as possible, and try to go a little bit faster every time. None of this is easy, and no improvement will happen if an exercise is done one repetition at a time with lots of rest in between. To really get fitter, every workout should be attacked with intensity.

Now that we have an idea of what CrossFit is, let's discuss the stereotypes – as promised.

An often-repeated piece of criticism raised towards CrossFitters is that they are supposedly not real athletes. Watch a video on YouTube of a CrossFit athlete doing some Olympic lifting training, and you are guaranteed to find comments saying: "X professional Olympic lifter can lift much more!". Or, with footage of a workout including running: "This guy wouldn't stand a chance against a marathon runner". These people are completely missing the point behind CrossFit. As stated before, CrossFit is not about excelling at one particular thing, that's what Olympic weightlifters

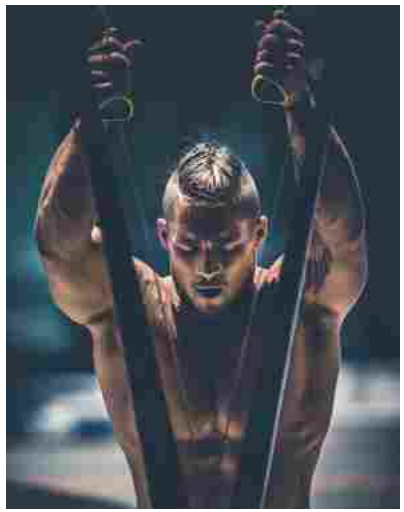
and marathon runners are for. A weightlifter probably won't be able to complete a marathon, while a marathon runner won't lift a lot of weight. A good CrossFitter might be able to do both those things, though maybe not as well.

Another example of this is the use of kipping pullups in CrossFit workouts. "Kipping" is a technique that can be applied to most bodyweight exercises, whereby momentum from the body is used to make the movement easier and more efficient. In the pullup, this means the momentum of a swing of the legs is used to drive the hips upward and propel the body towards the bar. This requires much less energy than the traditional "strict" pullup. Some people ridicule this method of doing pullups, saying it looks silly, requires no strength or skill, is not a real pullup, and, worst of all, that it's cheating. Unfortunately, these people again are missing the point. The reasoning behind this technique is as follows:

"Kipping allows more work to be done in less time, thus increasing power output. It is also a full-body coordination movement when performed correctly, which applies more functionally to real-life application of pulling skills. Last, but not least, the hip motion of an effective kip mirrors the motion of the olympic lifts/kettlebell swings, adding to its function as a posterior-chain developer."

So the kipping pullup is not a way to "cheat" on strict pullups, they are a more effective way to get work done and a much more effective way to simulate real-life pulling strength, thus making it a much more functional movement. And, as we know now, this is an integral part of the CrossFit ideology.

A final point of critique many CrossFitters encounter is that they are supposedly taught movements in a way that is harmful to the body. Personally, I have no idea where this myth originated from, but luckily for people who practice the methodology it is untrue. Before being able to open a box (that is what a CrossFit gym is called) you need to be a certified CrossFit trainer. This means that regardless of the box you train at, the trainers are guaranteed to know what they are talking about. Compare this to any regular gym where literally anyone paying for a subscription can come in and use all sorts of potentially dangerous equipment without having to have the slightest idea of how to use it. A good example of this is one of the most well-known and basic bodyweight exercises: the pushup. In a regular gym it is very common to see people do pushups with elbows perpendicular to the body, which is very harmful to the



shoulders in the long run, while only bringing their chest halfway to the floor – just ask any regular gym-goer for confirmation. At CrossFit however, one of the very first things athletes that are new to the sport learn is how to perform a proper pushup: elbows stay to the side of the body to prevent shoulder injury, and the chest touches the floor on every repetition for full range of motion.

We see then that a lot of the criticism CrossFit receives is unjust and based in misunderstanding. Luckily there are, besides the ones that don't know it or don't like it, also a lot of people that love CrossFit. One thing all enthusiasts – and even some of the haters – can agree on is the closeness and positivity of the community. I have talked before about the "ideal athlete". For most "regular" people that goal is of course unattainable. But for a lot of people, that is not what practicing CrossFit is really about either. The real goal for a lot of people is simply to become a better version of themselves, and CrossFit for them is the way to do that.

This is why most regular people training at CrossFit boxes seem to have a deep sense of respect for each-other. Whether you are training twice a week or twice a day, everyone is there with one shared goal: to improve themselves. After a grueling workout, everyone will be high-fiving each-other and complimenting everyone on their performances. If everybody is done but one person, they will all go to that person and cheer them on until they have finished too. If somebody hits a PR, whether it's 20 or 200 kg, everybody will applaud. Janitors will be training next to high-ranking CEO's, soccer moms will be working out with students. But in training, nobody cares about that; they are all just struggling through the workout together. For most people, that where the real strength in CrossFit is. And whether you are a professional athlete or not, at the end of the day it is all about wanting to improve yourself and just getting a little bit fitter.

Batavierenrace on the motorcycle

Dave van As

During the 45th version of the Batavierenrace, I was again a motorcyclist. Hundreds of motorcyclists participate in the Bata, but I had a different job. This is because I have been a driver for the BataRadio for years now. BataRadio is organized by students and was once re-created by another Astatine member, Martijn Meefout. Since the start of BataRadio I have been active in arranging the reporting from the back of a motorcycle for the last stage of the run. This year it was different as last year BataRadio has grown and used live video to show the Bata as well. For the first and last stage of this year a motorcyclist would take a cameraman on the back to livestream the first runner. From the market square of Nijmegen to the restart at the Nijmegen University, I was responsible for driving the cameraman. With some crappy preparations and a small test drive half an hour before the start, we took off just ahead of the runners. It could be that you followed this live on the internet or warmly and safely from a Bata-van. As for myself, I couldn't possibly follow what was happening. When driving such an event your focus lies somewhere else completely. Are you driving fast enough, or too fast? Is the distance between the runners large enough? Are you not hindering the runner? Eventually it goes automatically, and soon enough you reach the end of the stage. Here the evening ended for me but just started for the hundreds of other motorcyclists. They will secure the roads for the runners and make sure they reach the end of each stage.

After waiting for the start at the University of Nijmegen I drove back to Enschede to rest and make sure to be back for the restart at the Oude Markt. From the Oude Markt I would drive the radio reporter for the last stage. Just some minutes before the start it got pretty tense as the radio hardware was not on scene yet. Luckily the women's restart got postponed for ten minutes, which gave us the possibility to get ready for the start. Just before the women could make their first steps we drove off, following the police motorcycle which cleared the way for us. After about 8 minutes of driving just in front of the fastest woman, we were forced to drive back to the Oude Markt again to report for the men's restart. We arrived just in time and drove off again to inform the radio station about the moves of the men running in front. It became difficult for the police motorcyclist to clear the road when we eventually had to overtake the running women in the back of the race.

Arriving at the campus, you could really feel the energy of all the students spraying water, cheering and yelling. The arrival on the UTrack was even better with the thousands of students and hundreds of motorcyclists revving their engines. You can imagine that every year the Bata is such an energizing event, and I would strongly advise everyone reading this poorly written article to join next year. Either as a runner, a volunteer or a motorcyclist. It's always worth the effort; it's just one great adventure.

Next to that I would like to thank MotoPort Hengelo for their quick and efficient help in arranging a suitable motorcycle!

Greenteam

Towards a world of hydrogen - Green Team Twente

Sevim Aktas

I always have this feeling of wanting to do more. I want to contribute my part to the world, but what exactly is "my part"?

I found the way towards my personal goal in Green Team Twente: My personal goal is to make the world a better place. Really vague, really cliché and at the same time it may sound a bit naïve. In the first instance yes, maybe, but let me introduce you to the possibilities that you have, let me introduce you to your capabilities and your power to enhance your voice.

I used to wonder how I, as an individual, should be able to improve our environment. I mean, I am Sevim Aktas, a random girl studying Advanced Technology at the UT, right? But especially in these last few months I realized that it's never about where you are at or who you are, it's always about what you make out of each situation. It's always a matter of perspective.

In Green Team Twente I live in a community with like-minded people. This community of 20 students unites various Master and Bachelor studies and nationalities all around campus. Together we are building a car powered by hydrogen; a project which requires multiple disciplines to work together, ranging from mechanics and electronics of course to strategy, management, finance and PR. In Green Team Twente, we become influencers. So let me introduce you to our world of H2.

Green Team is an opportunity to show and apply your knowledge, deepen your understanding and at the same time learn a bunch of other soft and hard skills as well as new personalities which introduce you to new interests and cultures.

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Green Team Twente

Not only are we working towards the Shell Eco-Marathon, an international competition with over 250 teams from all around Europe, but are also raising awareness about the future innovation, the Hydrogen Car. Isn't it just incredible that 1L of fuel can drive 1000 km (gasoline equivalent), whereas it's remarkable for regular cars to go 20 km/L? Currently, hydrogen cars are at the beginning of their growth stage but the majority isn't aware of this fact. So starting with the university, with us students as being the future generation, my team and I are creating this atmosphere about Fuel Cell Vehicles being the solution for a sustainable environment.

Step by step, we are getting closer to the marathon which takes place in London this year, end of May. [*They won, red.*] Everything is getting real which means that the whole team slowly starts to sweat. By the way, ever noticed people walking around on campus with a red jacket stating Green Team Twente? That's us!

So, let's label this year in green and take initiative to make the world a better place. Don't underestimate your part in this and start to inspire the people around you.

Give yourself an ambition, a goal, a purpose of it all. Apply for Green Team Twente 2017-2018 and be part of this whole experience:

Send an email to secretaris@greenteamtwente.nl with your name, study and year of studies and we will get in touch!

UEFA Women's Euro 2017

Kevin Rouwenhorst

Female football is definitely not as well-known as its male counterpart, because of the lower degree of professionality. However, after watching various matches it appears the female game is a lot purer, they still play football as it is meant to be played. I have been working on a female football mod for FIFA 16 for months (Google FIFA Women 16 for some indications). Keeping in mind the upcoming European championship with the final in the Grolsch Veste in Enschede I will try to give you some impressions of the teams, so you will not go to the matches blankly!

Group A

Belgium is Holland's little sister when it comes to female football. In the attacking midfield and forward positions Belgium has stars in Janice Cayman and Tessa Wullaert. The entire line-up is rather strong, with many very promising talents, such as goalkeeper Justien Odeurs, defensive midfielder Julie Biesmans, central defender Elien van Wynendaele, right midfielder Elke van Gorp, and central midfielder Tine De Caigny. In the coming years much is expected of these players, but group A is very strong. In another group Belgium may have gone to the knock-out stage, but Denmark, Norway and now also the Netherlands are top teams. Prediction: 4th in group A.

The big dribbling sensation, the Messi or Dybala of European female football, is the 24 year old Danish Pernille Harder, having both the insight and passing of a playmaker and the killing shot and header of a striker. Next to this her lobs, impressive free kicks and long shots make her one of the absolute stars during the tournament. FC Barcelona's central defender Line Røddik Hansen is one of the key players, in the versatile and strong team. Hopefully goalkeeper Stina Lykke Petersen finds back her momentum from last Women's Euro. Many of the stars from then are over their top and this may be the main drawback of the team. Pernille Harder will have to carry the team. Prediction: 3rd in group A.

The big Dutch star is Vivianne Miedema, although only 20 years old, her positioning and excellent finishing make her the perfect modern striker, similar to Robin van Persie in his prime years at Arsenal. Many players with roots at FC Twente, the club playing in the Grolsch Veste, the final venue, are prominent first team players. Among these are defensive midfielder Sherida Spits, goalkeeper Sari van Veenendaal, right winger Shanice van de Sanden, central midfielder Anouk Dekker, and central defender Stefanie van der Gragt. Other stars, like left winger Lieke Mertens, attacking midfielder Danielle van de Donk and veteran defender Many van den Berg continue to shine in the bigger competitions. With this fresh and young team the Netherlands will be a power to be reckoned with in the coming years. Prediction: 2nd in group A.

Despite only being 21 years old, Ada Hegerberg has already won the greatest club honors, including the Women's UEFA Champion's League with her club Olympique Lyon, while being one of the absolute stars. She compares to a younger Zlatan Ibrahimovic, being majestic with both her feet and her head, combined with a substantial agility and strength. Another rising star is the right winger and striker Caroline Graham Hansen, possibly the greatest prospect of female football. After a long period of injuries she seems to be filling in on her promise and women's Euro 2017 may be her moment to mark as a world class player. The familiar faces of right midfielder Kristine Minde, central midfielder Maren Mjelde, defensive midfielder Trine Rønning combined with new stars such as goalkeeper Cecilie Fiskerstrand and striker Synne Jensen make the team a great contender for the knock-out games. Prediction: 1st in group A.

Group B

Germany's superstar is the Hungarian born Dzsenifer Marozsán, arguably the world's best playmaker. She is world class in passing and has an amazingly strong long shot, especially in her right foot. She scored the deciding goal in the 2016 Olympic Games final, leading Germany to their first ever Olympic football gold medal, and months later she was named captain of the German team. In front of her is the finisher and target Alexandra Popp. Not yet being as great as Miroslav Klose or Birgit Prinz, Popp fills up the spot of the retired Célia Šašić. The attack is further bolstered by Anja Mittag, the strong central forward, who resembles a younger Francesco Totti. The new generation, goalkeeper Almuth Schult, right midfielder Melanie Leupolz, left back Tabea Kemme, right back Leonie Maier, and central midfielder Sara Däbritz are filling in their positions of the highly renowned players of the past years. There is only one expectation for the team, namely winning the tournament and thus winning the 7th successive title. Prediction: 1st in group B.

Italy has been around in female football for quite a long time, but is not excelling in recent years. With striker Melania Gabbiadini (Manolo's sister), left back Raffaella Manieri, central midfielder Martina Rosucci, and right back Sara Gama, Italy has a decent engine. Overall the team is decent, yet Germany and Sweden are world class teams and are expected to win against Italy. Italy is expected to withstand the teams better than Russia, however, and Italy is likely to beat Russia. Prediction: 3rd in group B.

A few years back Russia was a strong team with goalkeeper Elvira Todua as one of its stars, and defensively the team still stands with Anna Kozhnikova, Ksenia Tsybutovich, Daria Makarenko, and Ekaterina Dmitenko as candidates for the central defensive block. The new generation does not live up to the previous generation, and only players like right midfielder Margarita Chernomyrdina, attacking midfielder Anna Cholovyaga, striker Ekaterina Pantyukhina, and central midfielder Elvira Ziyastinova have yet filled in their promise. Their East-European playing style may still be a problem for the West-European contender, but it is not expected the team plays a large role in the tournament. Prediction: 4th in group B.

Sweden's strength lies in their defense. Nilla Fischer is their unorthodox veteran central defender. She reminds something of a young John Terry, a leader in the field, having won various big prices both with club and country. The Swedish defensive midfield veteran Caroline Seger has the judgement and vision, as does Andrea Pirlo in male football. Hedvig Lindahl, Sweden's goalkeeper, has been the absolute hero in Sweden's campaign in the Olympics last year, saving many penalties, and she is arguably the best goalkeeper at the moment, a puncher like Gianluigi Buffon. The agile dribbler Kosovare Asllani serves the attack. There are various options for the striker positions, namely the veteran striker Lotta Schelin, Sofia Jakobsson, and rising stars such as Stina Blackstenius and Fridolina Rolfö. This shows the class of the team, yet also the Achilles heel, as in other positions the team does not have new world stars ready yet. Prediction: 2nd in group B.

Group C

Austria's powers lie with FC Bayern München players Carina Wenninger and Viktoria Schnaderbeck, midfielder and defender currently. Nina Burger, a veteran target, is one of their attacking qualities. Even though having a decent line-up, the team is expected to fall short against their opponents, especially France. Prediction: 4th in group C.

The French talisman is the defensive midfielder Amandine Henry. As a true engine of Les Bleus she has everything a defensive midfielder should have: the defensive instinct to intercept and step in, the perfect passing of a playmaker, and when chance allows, a keen long shot. Henry is accompanied by Camille Abily, another experienced defensive midfielder. While the male team has a young defensive star in Raphaël Varane, so does the female team in the tall Wendie Renard, the absolute rock in the defense. France's attack has some fast legs, such as Eugénie Le Sommer and Elodie Thomis, and veteran in Gaëtane Thiney. In the back goalkeeper Sarah Bouhaddi and central defender Laura Georges are familiar faces. However, it is also expected that talents like central defender Griedge Mbock Bathy Nka, left back Amel Majri and left midfielder Claire Lavogez, the Louisa Nécib of the new generation, will get playtime. France is simply a world class team. Prediction: 1st in group C.

While the male team was a big surprise during Euro 2016, the female Iceland team has been doing well for years. Their engine is VfL Wolfsburg's Sara Björk Gunnarsdóttir, while veterans like strikers Margrét Lára Vidarsdóttir and Harpa Thorsteinsdóttir, left back Hallbera Guðný Gisladóttir, attacking midfielder Hólmfríður Magnúsdóttir and goalkeeper Gudbjörg Gunnarsdóttir add their experience to the team. However, this is also Iceland's weakness, as their greatest stars are already over their top. Hopefully Dagný Brynjarsdóttir can score a 30 meter goal, as she does from time to time with her club Portland Thorns FC. Prediction: 3rd in group C.

The Swiss superstar is Ramona Bachmann, Chelsea's agile right winger and dribbler. Especially during her last year at FC Rosengard she strongly resembled Lionel Messi, for her easy dribbling in the 16-meter area and the perfect positioning and walking lines. On the other flank, the veteran left midfielder Lara Dickenmann bosses the entire spectrum, both offensively and defensively. Next to these renowned stars the Swiss team has a lively spirit and

the battle for the second place with Iceland is a heavy one, however Switzerland is a stronger team over the entire line-up. Prediction: 2nd in group C.

Group D

Similar to Thiago Silva in male football, Steph Houghton is rock in the defense in female football. Next to a great header, the English captain and MBE has a remarkable passing technique, a long shot and even a strong free kick. Next to her the right back Lucy Bronze plays, the true engine, constantly running back and forth, as untiring as Stephan Lichtsteiner. Arsenal's Fara Williams is the classy and experienced midfielder of the English team, known for her excellent long passing skills as a playmaker. Right midfielder Karen Carney, another veteran, has been dribbling opponents crazy for years. Being strong on all positions, England is a good contender. However, just as for the male team a true attacking superstar lacks in their team and this will be a problem in the knock-out matches. Prediction: 1st in group D.
Portugal is one of the least prominent teams on Women's Euro 2017. Right flank players Ana Borges and Claudia Neto are key players, while Amanda da Costa continues to shine in the USA. Although having a decent line-up with many agile options in the attack, the female team does not have a world star equivalent to Cristiano Ronaldo. Prediction: 4th in group D.
Kim Little somewhat remembers us of a younger Wesley Sneijder, having the main passing and shooting abilities of a pure number 10, but also the flair of an energetic young person. Although being an attacking midfielder, she is sometimes also compared to a younger Wayne Rooney, due to her pure qualities, winning many individual and club honors. The Scottish team is not only Kim Little however and players like striker Jane Ross, left wingers Caroline Weir and Lisa Evans, defensive midfielder Jennifer Beattie, and central defender Rachel Corsie play in the bigger competitions of England, Germany, and the USA as well. A drawback of the team is their low number of quality players, making the team vulnerable upon injuries of star players. Prediction: 3rd in group D.

The female David Silva going by the name Vero Boquete was the star of the American and Swedish competition some years back and now she shines for Paris-Saint Germain. Being a 10, she can also play on the wings, the central midfield position, and the striker position. Spain is an upcoming team and other veterans like left midfielder Sonia Bermúdez, attacking midfielder Jenni Hermoso, central back Ruth García and right back Marta Torrejón continue to shine. The new generation of left midfielder Alexia Putellas goalkeeper Lola Gallardo, and striker Olga García brings the right balance and the team managed to win the 2017 Algarve Cup. Spain is an upcoming force to be reckoned with in the knock-outs. Prediction: 2nd in group D.

If my predictions on the group stage turn out to be correct, we may expect some classics in the quarter-finals. Germany-Netherlands, Norway-Sweden, England-Switzerland, and France-Spain are the likely matches. Some of these matches are expected to be tight, especially on the Norway-Sweden match. Germany seems to be a class better than the Netherlands, just as France is more ahead of Spain and thus likely to win. In the other matches the goalkeepers can play a crucial role. Hedvig Lindahl can do the same trick as during the Olympics, and Karen Bardsley can show why she has been one of the best for the last decade.

This would lead to the semi-finals Germany-France and Sweden-England, the Nr. 1, 3, 4 and 6 of the FIFA Women's Wold Ranking (as of March 24th 2017). In this stage the games are more like a lottery and no firm predictions can be made. The last match between Germany and France was a 0-0 (March 4th 2017 during the SheBelieves Cup). Similarly last England-Sweden encounter ended in a 0-0 (January 24th 2017, friendly). France won the 2017 edition of the SheBelieves Cup, a tournament with England, France, Germany and the USA, and is assumed to win the match with Germany. England ended up being 3rd, whereas Sweden only finished 7th out of 12 in the 2017 Algarve Cup, and thus England is expected to win the match against Sweden. This would lead to something special, Germany not prolongating the title and one of the finalists will win their first Women's Euro title ever. Between England and France my odds are on France. The match against Germany can be devastating, but France has a much better bench than England and subs are definitely going to make the difference.

Recipe

Cheerful Chef

Zahra van Egdom

This time I have my version of a spinach mushroom lasagna I found on damndelicous.net. It is very delicious but a very heavy meal! So what do we need to do?

1. Put the lasagna sheets in some cold water and set it aside.
2. Dice the mozzarella in small cubes and mix with all the other cheeses in a bowl and add two tablespoons of Italian herbs, set this aside as well.
3. Chop the onion finely.
4. Put the spinach in a pan and fry it with the onions.
5. Add a teaspoon of salt. Be careful; there is a lot of cheese, so a lot of salt is already present.
6. Fry until the spinach is defrosted and the onions are cooked.
7. Take it off the heat and mix it with the cheese mixture
8. Preheat the oven to 175 degrees Celsius.
9. Slice the mushrooms and fry in a pan with some olive oil.
10. Chop the garlic and add it with a tablespoon of Italian herbs and one teaspoon of salt to the mushrooms.
11. Add the flower and cook for one minute.
12. Gradually pour in the milk and let it boil, then reduce the heat and let it cook it until it has thickened, about 3 minutes.
13. Take it off the heat.

Now we can start layering, we're going to have five layers as shown on the right.

Put it in the oven for about 40 minutes and then it is ready, enjoy!

Cheesy Spinach & Mushroom Lasagna (for 4)

250g lasagna sheets
250g ricotta
250g mascarpone
250g grated cheese
100g grated parmesan
2 mozzarella's
450g spinach, frozen
400g mushrooms
1 large onion
40g of flower
700 ml milk
Italian herb mixture
2 cloves garlic

1 Mushroom sauce Lasagna
2 Cheese mixture Lasagna
3 Mushroom sauce Lasagna
4 Cheese mixture Lasagna
5 Mushroom sauce cheese mixture

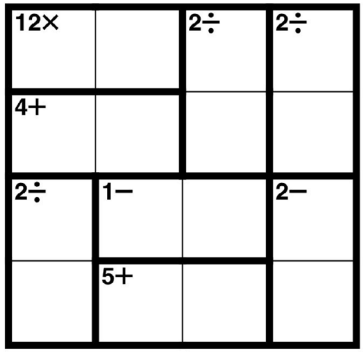
Puzzle

Kenken

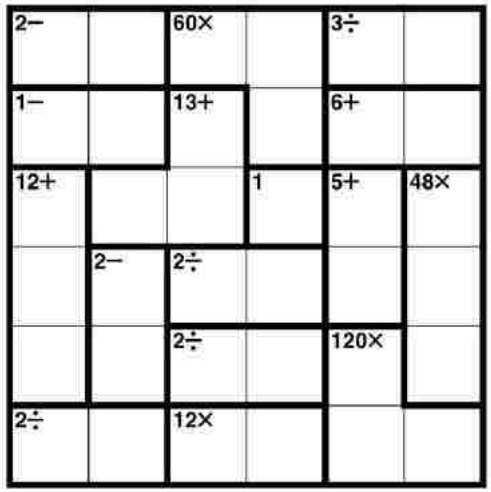
KenKen

Almost like Sudoku: In the first case each row needs to have all the integers from 1 to 4, for the other two all from 1 to 6. Only one number per box. Numbers inside a bold box need to give the number in the upper left corner of that box after addition, subtraction, multiplication or division, as indicated by the sign besides that number. *Solve all three to claim the price!*

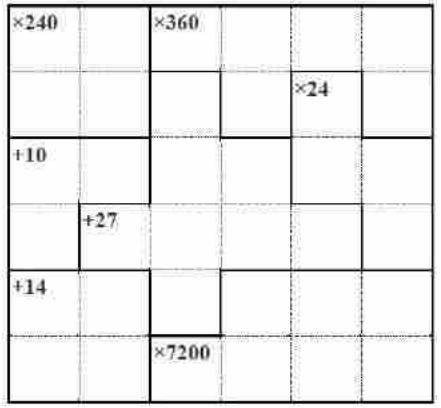
For the sake of practice:



A little bigger version:



And a last one because it's fun:



Small side note: For the subtraction and division boxes it does not matter which of the numbers that yield the result you place first.

The solution for the puzzle in 11-2 is "nanotechnology" and the winner of the cinema coupon is Egbert Loeffen!

Maak uw bijdrage over op banknummer 59.27.19.189 ten name van Stichting Universiteitsfonds Twente.

Op onze website www.utwente.nl/ufonds kunt u makkelijk en veilig via IDEAL een bedrag overmaken.
Daar vindt u ook meer informatie over notariële schenkingen.

Hartelijk dank namens de studenten van de Universiteit Twente.

Met het Universiteitsfonds Twente komen ze verder.

Word nu donateur!

Stichting Universiteitsfonds Twente

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