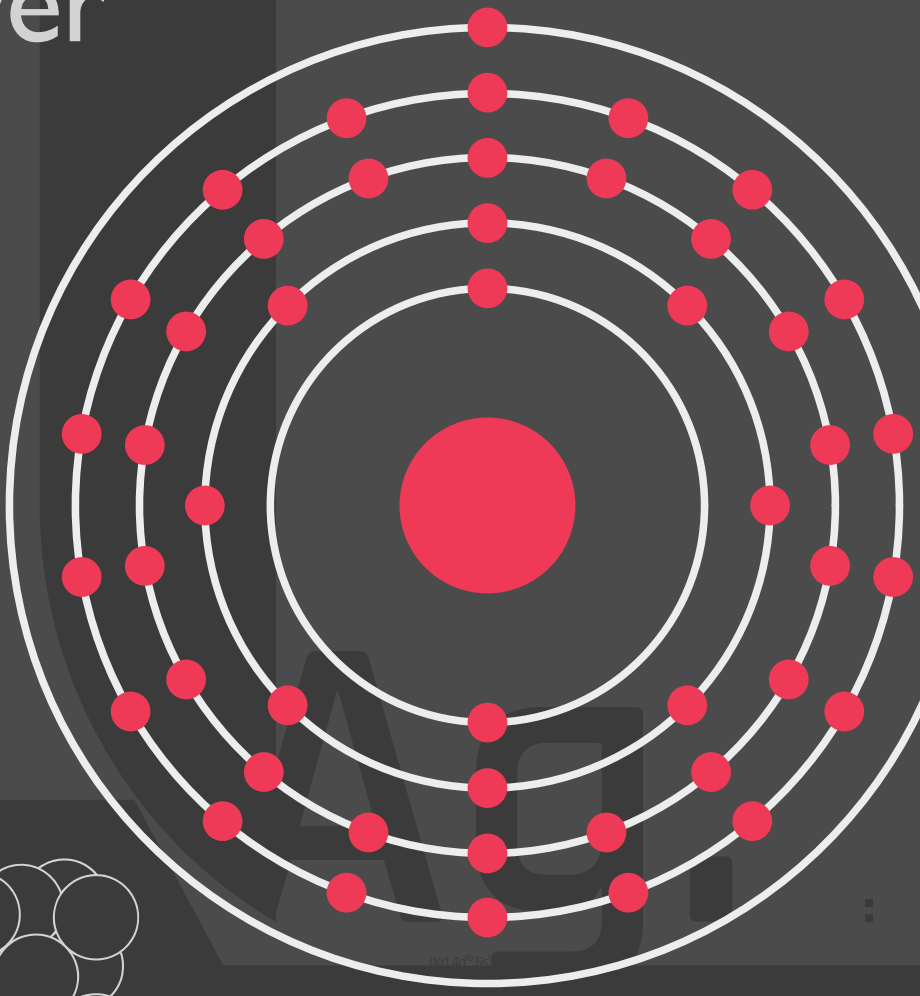
Comic
Gold and silver walk into a bar

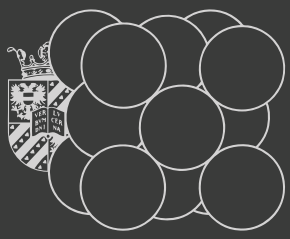
Francken Abroad
Stef has lived in San Francisco working for Google

Winter recipes
Francken's family winter recipes

Francken Vrij

Silver

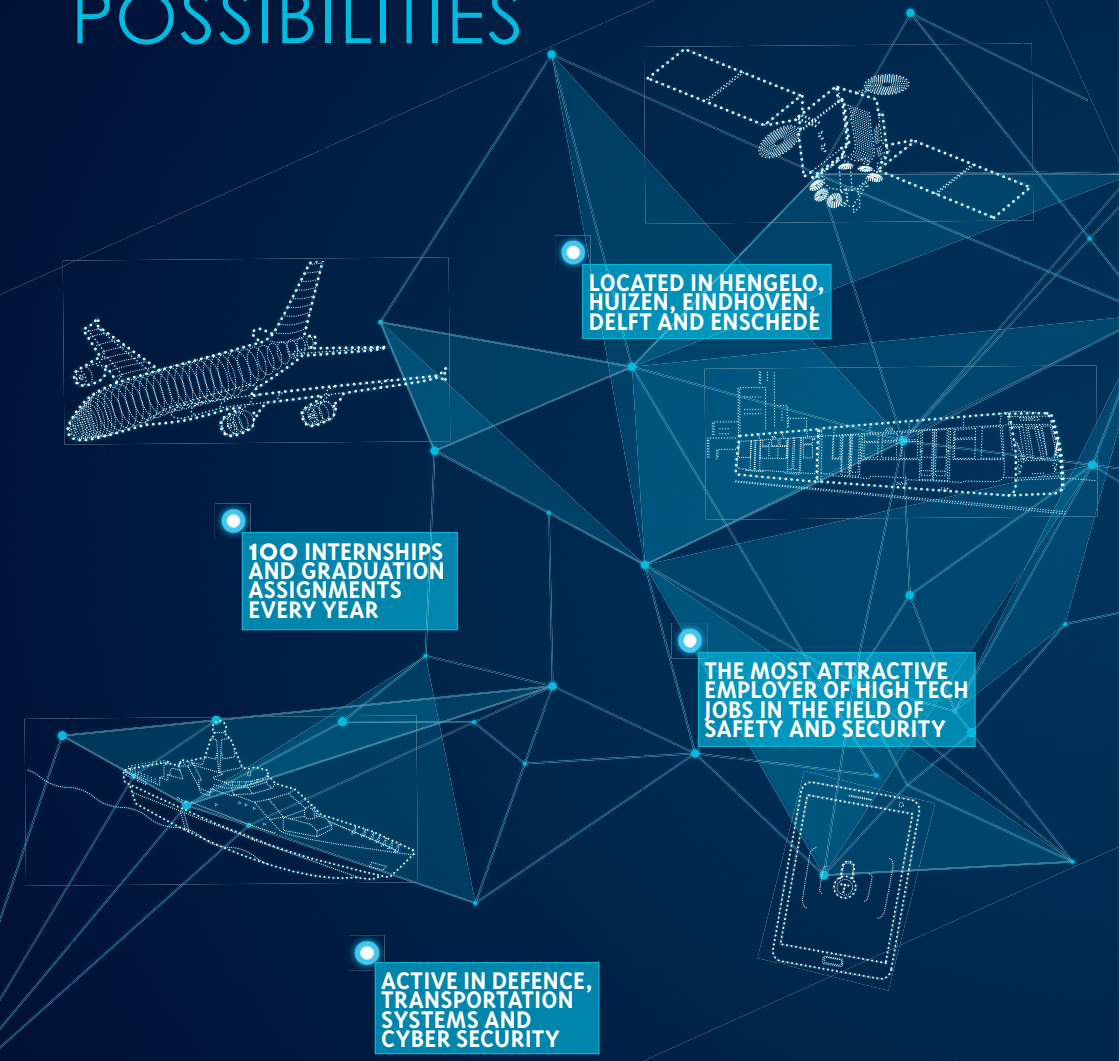




25.1 Silver

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Editorial
It is a lustrum, a lustrum, we're twenty-five years old! A lustrum, a lustrum, and our future will be ~~gold~~/silver.

You are reading that right, this is the 25th year of Francken Vrij! Happy birthday everyone! As is usual, this edition is a tiny bit later, but that's partially because we are preparing an amazing year for you. This edition will still be quite standard, but I do promise you that we are looking for exiting ways to spice up the next editions.

Last edition you've received a flyer with information on moving the Francken Vrij online. If you have any questions we and the board are always available via email.

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Melav Salih
The first preface written by Melav as chair of the association,

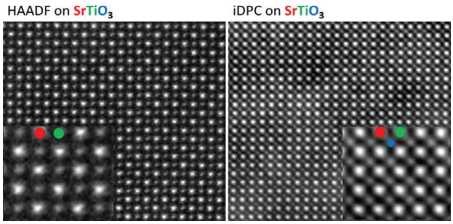


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Since the new board got hammered in, there have been several social and study related activities. Tabitha will recall some of the highlights for you.

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A ship from the silvervloot has shipwrecked and the captain is afraid some pirates are after his treasure. He booby-trapped his treasure but forgot where he put the traps. Luckily he left some clues for himself. Can you help him find his treasure safely?

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Stef van Grieken
Some of the older members might still remember Stef. Sadly we haven't seen him in a while, since he started his job across the globe at Google, but he has written about what it's like to live in San Francisco.

18 Comic
Bradley Spronk
As is tradition at this point, Bradley has made us a lovely comic. Go to page sixteen to find out why there is a picture of a bar at the top of this page.



28 Winter recipes

Don't know what to cook during these dark days? No worries, the Francken Vrij got you covered! Find some amazing (family) recipes from the home countries of the editorial board. With special thanks to Wouter Haarman.

19 Inside view

prof. dr. ir. Bart J. Kooi

Not only is this the 25th anniversary of our magazine, but it's also professor Bart Kooi 25th anniversary of working for the university! Professor Kooi has written about the study of metal-oxide interfaces using internal oxidation. Silver is an excellent metal matrix for internal oxidation: it doesn't oxidize in air itself.



26 Life after Francken

Valerie Siahaan

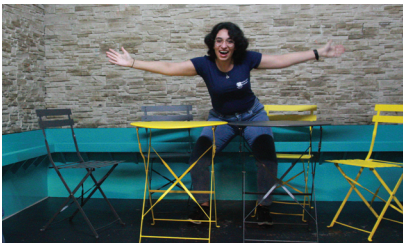
It has been quite some time since Valerie was part of the board of the Beta Business Days. Her *life after Francken* started in 2017 and she moved to the beautiful city of Prague.

Chair's preface

By Melav Salih

One must begin these days by wishing everybody their sanity in these unusual times. However, we're also nearing the winter vacation so I would like to wish everybody happy holidays! May you be celebrating Christmas, Hanukkah, and/or New Year's, I hope you still find yourself surrounded by the warmth of your loved ones.

As we, 'Charm' the board, learn how to overcome the pandemic through crisis management, any and all resistance between us has faltered away. Troubling times can bring people closer together than ever. We are optimistic about the future and try to find a silver lining in all that happens. Since we do not have to open or close the Francken room everyday at a specific time, we haven't had as many hangovers or days where another board member opens the



room to find it had been left a mess from a borrel the night before. Yet, we yearn for the attraction of other students to our association by making toasties or serving free coffee. 'Charm' can only hope to see some of you in passing these days.

On another note, try to find all the references to silver I tried to make in this piece! Ironically (or maybe not), silver is believed to be associated with feminine energy. I think that is quite fitting in a year when the board is an all-female one. Stay safe and let me know if you need a sanity check!

News of the association

By Tabitha Minett

Amidst a pandemic, it's very lucky that we've been able to organise some wonderful events this year, and now we get to relive them in the following pages! Events in September took place in person, of course adhering to the corona measures, but as the situation worsened activities moved to online environments. However, we were fortunate enough to have some terrific virtual activities!

Introduction week: Pub quiz, AP Burgers, BBQ

The year began by welcoming the freshmen at Buckshot for a pub quiz.They competed through rounds of questions, with loempia and bitterballen in between. More food followed the next day at Pappa Joe! The week ended with a BBQ at Hoornseplas, joined by older members too! We played Werewolf, ate good food, and cooked way too many sausages. A lovely start to the year!



Committee Running Dinner

Instead of the usual committee market, Borrelcie, Wiecksie, and S.L.E.F. cooked a three course meal, with small groups of members stopping by each location to enjoy some dinner and learn more about each committee. It was hugely successful, with each committee recruiting several members and everyone meeting new people. Really, I'm just glad I didn't have to do the washing up.

Karakterborrel

Francken members gathered at Gelkinge 9 for this year's first Karaketerborrel! I was particularly intrigued by the brightly-coloured shots and was excited to oversee a corona-proof game of beer pong.

Unfortunately, the sjaars were beaten by the older members, but they have many years ahead of them to practice.

Games Night

The Fraccie organised their first event of the year and the final in-person event of the year: a night of games, chilled beverages, and merriment at HSA. Members may be more familiar with the location as the "Jam Session place", but for the evening tables and chairs were arranged such that everyone could play games in small groups. We played card games, Skribbl, Who's the Dude; the latter I'd never heard of, and was even more confused when I saw an inflatable man in the corner.





AP pubquiz

The Applied Physics committee hosted their annual pubquiz, equally fun online! Participants were treated to a pub-package with beers and snacks, the essentials for getting through tough questions about Applied Physics and our association. To no one's surprise, the winning team consisted of some older members, while the younger ones tried their best.

Online escape room

The Fraccie teased us in the run up to the event with a short video that seemed quite peculiar, but of course it was integral to the start of their event. Teams worked their way through a series of challenges, from Wikipedia trails to picture hunts, with most teams stumbling on the algebra round. Lucky for my team, Emma ploughed through the maths and we went on to victory!

ZIAM Lab Tour

To give the Applied Physics freshmen more of a taste for the field they're studying, ZIAM lab tours were arranged, during which they were given an insight into research being carried out by the groups and the kind of labs they work in. Even though they were online, the tours were a success, and will be arranged for second and third years in due course!

S.L.E.F. Announcement borrel

After the unfortunate cancellation of S.L.E.F. 2020, everyone was eager to find out the destination for 2021! But the S.L.E.F. board made us work for it, so teams had to work through challenges to get access to the announcement video. I've actually rewatched the video several times because I find it so entertaining, and I love to get excited that "Buixie+" is to Italy and Switzerland!



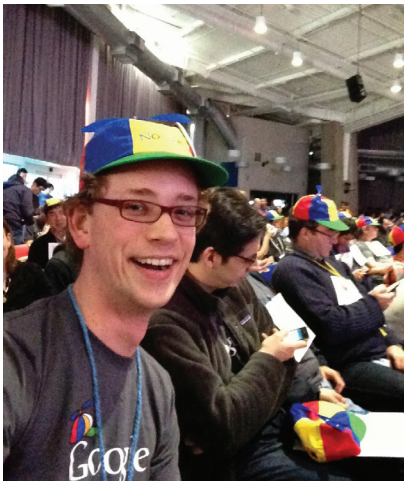
Francken Abroad

By Stef van Grieken

I'm Stef, 34 years old and recently moved back from the San Francisco Bay Area. I'm probably a bit of an uncommon member of Francken as I studied Industrial Engineering and only became a member during my year in the University Council. I represented our faculty and grew close to the board. During that time, I learned that Francken organized by far the most fun parties of the Maths and Natural Sciences faculty. It also allowed me to actually pay for my drinks and snacks in the members room whenever I visited. So treat me as a Francken fan that loved to crash a party once in a while.

It's hard to summarize what has happened to the United States and the Bay Area in the last six years. I moved to San Francisco in 2015 to work at Google as a Product Manager, arriving at the tail end of the Obama presidency. Working for a technology company was considered cool in the public's eye. America was going places and finally seemed to be turning progressive. It felt like they could only go up from there.

Let me start with the city itself. San Francisco is an amazing place to live, especially when you don't have kids yet. The city is relatively small and wasn't able to grow as much as other US cities because it is locked in by the ocean, the bay and a nature reserve in the south. This gives it a small city vibe. Most places are walkable. You can hop on the tram to get to the ocean, walk to the Mission and Castro districts for a beer or bike to downtown all in under 20 minutes. San Francisco is one of the few cities in the



United States with a truly unique character. The hills, the two bridges, the architecture (most often still intact buildings in Victorian style), the trolly cars and many of the old ethnic neighborhoods (Chinatown, Japan Town, North Beach) makes it feel much more European than other places I visited. If you are into nature, San Francisco is one of the best places to be. You can be outside the city in 30 minutes, into old Redwood Forests with trees older than the beginning of our calendar, or get lost in Ocean Vistas that are truly world class. It definitely has some downsides as well. The first is definitely the inequality. San Francisco is home to one of the largest homeless communities in the United States. It's heartbreaking to see people suffer and the government seemingly unable or willing to fix the situation. It's also a very expensive place to live. It often ranks at the top of the chart with respect to cost of living. I rolled my eyes when my first landlord told me $4700 for a two bedroom apartment was actually a good deal. Finally, if you like seasons, don't go to San Francisco. Except for when Carl the Fog comes around and the temperature drops dramatically, it is basically in perpetual mild summer all year long with temperatures being very moderate.

Most people go to the Bay Area for its research major universities, Berkley and Stanford, as well as the local tech scene. It's probably one of the densest places with regards to talent in the world. The startup ecosystem is enormous compared to the Netherlands, with over €45 billion invested





in the Bay Area alone, compared to €1.1 billion in the Netherlands. The diversity of people in the Bay Area is fantastic. In my last team we worked with people from 32 different countries. And everyone is there to make a positive impact on the world.

I started working on the Google Social Impact engineering team. This is a group that focuses on delivering social value through Google products. I had the opportunity to launch the first election features in Search and did a bunch of work on crisis response features in Android. Then I moved to the Maps team to work on launching some of the early location analytics features, such as understanding where traffic jams are and how busy it is in certain places. After that I moved to Android to build the Android Auto experience that allows you to use your favorite apps such as Spotify and Google Maps in your car by plugging in your phone.

The highlight of my time in the Bay Area was when I was asked to join Google X, the advanced development arm of the company known for projects like Waymo (the Self Driving Cars). I got the opportunity to work with a diverse group of some of the most talented people in the world. I can unfortunately not disclose what we worked on. We ended up being acquired into Google, where I led applied machine learning and infrastructure projects for Research & Machine Intelligence.



Working at a technology company really burst a few of my assumptions about working life. As most of you are still building your skills and thinking about a future career, I wanted to share the most important lessons I learned with you:

- *Be the dumbest person in the room*: I've learned throughout the last years that in order to get better, you need to find ways to work with only people that are dramatically better than you. I found that the fastest way I learn is not by joining a consulting or studying more, it's by observing and copying the behavior of the best. Try to aim at least 50% higher than what you think you are capable off;
- *Fall in love with the problem, not the solution*:

  Engineers have a tendency to really fall in love with a technical solution. They will go through great lengths in defending it as 'the best way' to solve the problem. I found people are prone to lacking the flexibility to make changes to their plans and end up getting stuck. If you are doing something difficult, assume that everything you thought about the solution at the start was wrong. If you can remain curious about the problem and learn in a validated manner you can succeed
- *Technical knowledge, business expertise, creativity*:

  University focuses a lot on your hard technical skills. These are super important, but they only get you a limited distance. I found that the best people who understand the tech know how to make money, but above all, have enough creativity to challenge existing ideas;
- *Set unattainable goals*:

  Be audacious in what you aim for. If you aim for the moon and you land somewhere in lower orbit, you still achieved a lot. Many teams try to only solve a problem incrementally.

- *Build a diverse team*:
  Find people that look and think differently than you. The more diverse viewpoints you can gather, the larger the chance that someone will point out a potential problem early.
- *Do the right thing, especially when no one is watching*:
  It's easy to get ahead by cheating. And unfortunately this happens a lot in technology companies and startups. People cheat their users, their investors and their co-workers to get ahead. This always comes back around. Be excellent to each other.
- *Pay it forward*:
  Silicon Valley has a mindset of paying it forward. You are expected to help out the next generation with your knowledge, network, and money. Help out others around you. They will pay you back someday.

I left San Francisco with a mixture of wonder and pessimism. Wonder about the perpetual optimism of the people. The breakthrough technological achievements. The focus on the long term future. The creativity and work ethic of the people. But I also left pessimistic about the longer term future of the country. The problems they are facing are enormous. The infrastructure is falling apart. The education system is on the brink of collapse (excluding the few top private institutions). The gap between the rich and the poor is massive, and only getting wider. And climate change is slowly making large parts of the country unsuited for human habitation (including California being on fire, covering the city in smoke two to three weeks every summer). Americans are not taking these problems seriously enough. And the large political divides left by Trumpism make me doubt if they will come together to solve them.

I would still recommend to anyone at Francken to live and work in the Bay Area for a while if you get the chance. The skills you learn and the people you meet will provide a new perspective on how to build the future. Just come back to Europe after a few years and go build a company.



Puzzle

By Arjen Kramer

A ship from the silvervloot has crashed, scattering pieces of silver all over a small island. The captain is afraid that while they are getting another ship to collect the treasure, some pirates will come and steal it away. Therefore he decides to leave a bunch of booby traps in some of the squares of the island. To keep track of where he placed them and to be able to safely collect the treasure when he returns, he places the booby traps in a special way:

1. No two booby traps are in horizontally or vertically adjacent squares

2. Clues written on the local scenery indicate how many booby traps are in that row or column, in the direction of the arrow

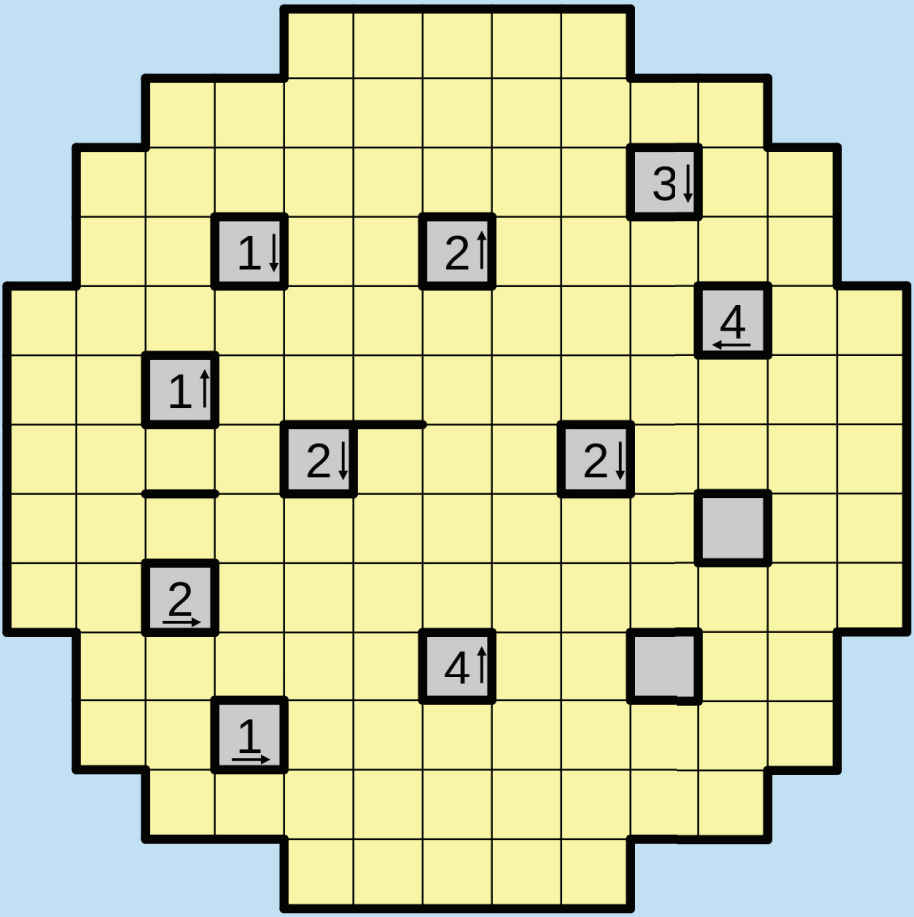
3. A single path moving through horizontally and vertically adjacent squares remains, that visits every non-booby-trapped square exactly once and returns to its starting point

4. This path doesn't visit the grey squares and can't cross the fat lines

And it is a good thing he did that, because when he returns, he has completely forgotten where the booby traps are. Help him locate the booby traps and reconstruct the path he originally planned out.

r	R	N	B	n	P	b	Q	K
Q	P	K	N	b	r	B	n	R
B	b	n	R	Q	K	P	N	r
K	n	R	r	P	B	Q	b	N
b	Q	P	K	N	n	r	R	B
N	B	r	b	R	Q	K	P	n
n	K	Q	P	r	R	N	B	b
P	r	b	n	B	N	R	K	Q
R	N	B	Q	K	b	n	r	P

Solution to the puzzle of 24.3


3
1
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4
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2
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Gold and Silver

By Bradley Spronk



Silver in Nanostructured Materials and Interfaces

By prof. dr. ir. Bart J. Kooi

First of all a big congratulation to the magazine Francken Vrij with their 25th anniversary! Particularly congratulations to the study association T.F.V. 'Professor Francken' and all the people involved during the last 25 years for making this possible.

An interesting coincidence: This year is also my 25th anniversary working for this university. After obtaining my PhD degree in materials science in Delft in 1995, I had the great opportunity to directly start as assistant professor in Groningen with a 2 year probation period as postdoc. So, both Francken Vrij and me can celebrate this year our Silver anniversary. This could be an interesting moment to look back and pick out some interesting cherries of research performed during the last 25 years and stay within the theme of the present edition of Francken Vrij and that is: Silver.

In 1995 in the group of prof. De Hosson we were interested in studying interfaces between metals and oxides at atomic resolution using maybe the best commercial transmission electron microscope (TEM) available at that time. Such hetero-interfaces, where metallic and ionic bonds meet, are interesting for fundamental studies, but they were also becoming increasingly more important for applications, particularly within microelectronics and electronic chips. Interestingly, this topic is still important till date (as will also be shown a bit below). In order to study metal-oxide interfaces we used a trick called internal oxidation, starting with a metal alloy where one minority element (only a few atomic percent of the alloy) has clearly larger affinity to become oxidized than the majority element. Under proper oxidation conditions this results in a fine dispersion of oxide precipitates in a metal matrix and thus the presence of many metal-oxide interfaces. Silver is an excellent metal matrix for internal oxidation: it does not oxidize in air itself, even at elevated temperatures, but its oxygen solubility is high and the oxygen atoms are also highly mobile. An example of an interesting result obtained at that time (recorded in 1996) is shown in Fig. 1. It depicts a nanoscale Mn_3O_4 precipitate in a silver matrix. Nanoscale particles have a strong

preference to be spherical, because minimize the surface area per volume. The Mn_3O_4 particles are not spherical at all, but sharply facetted with strong preference to have close-packed crystal planes of the oxide and metal parallel at the interface. In this case it is obvious that the type of interface is more important to minimize the energy of the system and not minimizing the area to volume ratio. However Mn_3O_4 is tetragonal and the Ag matrix cubic and therefore crystal planes of oxide and matrix cannot be easily parallel. This results in interesting interface structures from which we can learn a lot (but not suited to discuss more extensively here). The most favourable crystal facet of Mn_3O_4 when embedded inside the Ag would be totally unstable as a free surface due to electrostatic energy, because would be a polar surface with only negative oxygen atoms at the surface. However, when embedded inside a metal like Ag, the Mn_3O_4 facet is stabilized by image charges in the Ag which is of course a medium that can be easily polarized electrically.

Although the resolution associated with the image shown in Fig.1 is quite good (slightly better than 0.2 nm), certainly for that time, there are some problems when directly interpreting such TEM images. It is not directly clear where the atoms are. Even for a simple crystal like Ag its atomic columns can be imaged either as black or white dots, particularly depending on subtle focus settings.

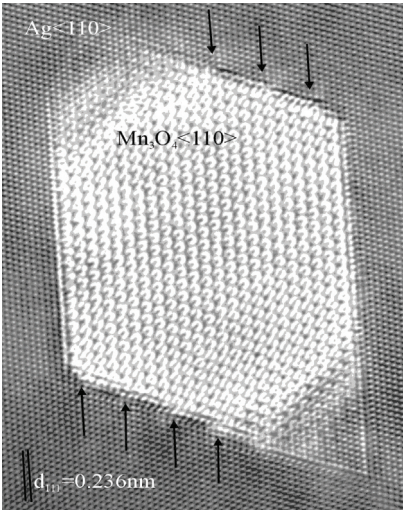


Fig. 1: Atomic resolution TEM image of a nanoscale Mn3O4 precipitate in a silver matrix recorded in 1996.

For the oxide it is even worse. The pattern originates from wave interference and it is impossible to directly see where the manganese and oxygen atoms are. Based on computer simulations an educated guess can be made, but the simulations are sensitive to experimental conditions like local sample thickness and focus value which are often not known precisely.

In order to create directly interpretable atomic resolution images we should not rely on the wave character of the electrons, but should use the particle character instead. Realizing this was not trivial. First, much better electron sources were required,

analogous to a (UV/Vis/IR) laser, which are called field-emission guns (FEGs), becoming available in the 1990ties. With such a gun many electrons can be squeezed inside a tiny probe which can be scanned over an area of a very thin sample and then images are recorded with transmitted electrons scattered to relatively high angles (on a detector called high angle annular dark field – HAADF). At these high angles the wave character of the scattered electrons is lost. Now if we can make an electron probe that is smaller than the distance between atomic columns, it is relatively obvious that when the probe is directly on top of an atomic column a lot of electrons are scattered to high angles, but when the probe is in-between the atomic columns there is very little scattering to high angles. The nice point is that in this way atomic columns are always imaged bright in a dark surrounding. However, a FEG alone is not sufficient for creating electron probes clearly smaller than the distance between atomic columns, because of aberrations in the probe forming lenses. So, only when aberration correctors where introduced a few years after the millennium change, STEM instead of TEM started to become increasingly popular in materials science, although the instruments are very expensive (starting price about 2 million euro). Of course not for biological and biomedical samples. There STEM can hardly be employed, because the very tiny intense electron probe will damage the sample too quickly. By the way, the first images of Corona-type viruses were recorded in 1966 (published in 1967) using TEM.[1]

Particularly the last 10 years aberration corrected HAADF-STEM has become the most popular tool in materials science for atomic resolution structure characterization. The advantage is not only that atoms are always imaged bright in a dark surrounding, but that the brightness scales with the average atomic number Z of the atomic column. In this way directly interpretable atomic resolution Z-contrast images can be recorded. An example is shown in Fig. 2 in the left image where the Z contrast between the atomic columns of strontium (Sr) and titanium (Ti)can be observed readily. However, a disadvantage of HAADF-STEM also becomes obvious. Oxygen atomic columns cannot be observed next to the Sr and Ti. It is not a problem to image even lighter elements than oxygen, like individual carbon atoms in graphene with HAADF-STEM, but the problem is imaging light and heavy atoms simultaneously. Also here a beautiful solution has been developed recently (in 2016) using iDPC-STEM (iDPC stands for integrated differential phase contrast, but it is beyond the scope of the present article to describe and explain this technique in more detail). See right image of Fig. 2. Here the O atomic columns show up clearly next to the Sr and Ti atomic columns. The nice point is that images can be recorded with the HAADF

and iDPC detectors simultaneously. Using iDPC STEM we have been the first in the world that could image the lightest of all atoms in the universe, hydrogen, properly next to a more heavy metal atom, titanium in our case.[2] This aroused quite some interest and for instance also ended up in a small article on the science page of the national newspapers NRC and NRC Next (Feb. 6, 2020). This year (2020) we were also able to image for the first time in the world oxygen atoms migration in samples biased electrically inside the electron microscope.[3] The samples were actually ferroelectric devices which are now a hot topic for novel nanoscale electronics including (RAM) memory technologies. The latter work is a joint collaboration with the group of Prof. Beatriz Noheda. For understanding properties and functionalities of advanced materials, knowledge of the precise local atomic structure, for instance at interfaces, will be indispensable and will make our state-of-the-art microscopes extremely valuable tools for a next decade of research.

With nanoscale silver we can do interesting things even on macroscopic scales. As an example I show here the huge influence deposition of different coverages of Ag nanoparticles on surfaces has on the overall wettability with water of these surfaces; see Fig. 3. This is research done in collaboration with Prof. George Palasantzas, where also

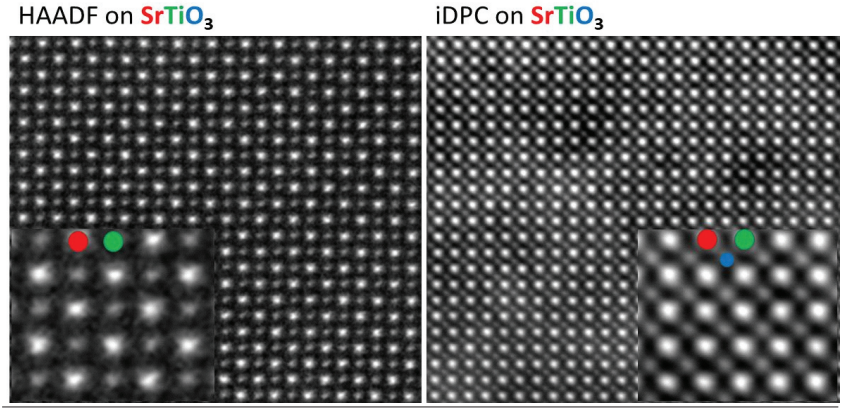


Fig. 2: Atomic resolution STEM images of $SrTiO_3$ recorded in 2019. Left: HAADF-STEM image showing Z-contrast distinguishing Sr and Ti atomic columns, but the O atomic columns are invisible. Right: iDPC-STEM image in which the O atomic columns are also clearly visible next to the metal atom columns, but the contrast between Sr and Ti is not observable. The power is that these images are recorded simultaneously with two detectors.

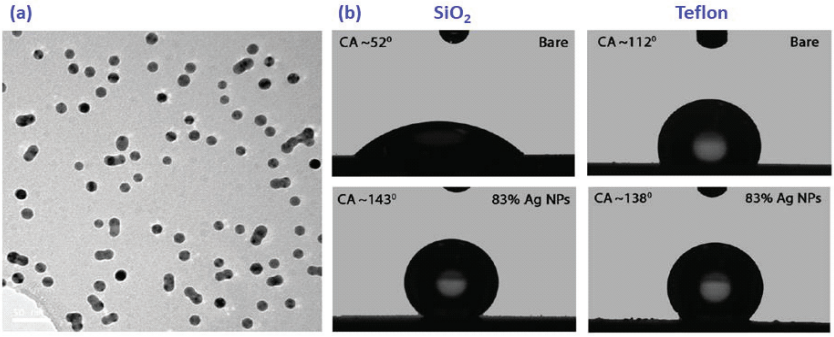


Fig. 3: (a) TEM image of the Ag nanoparticles (NPs) used for depositing on the surface having an average size of 13 nm with a relatively monodisperse size distribution. (b) Wetting experiments for measuring (static) contact angle for bare surfaces on top and for surfaces that were covered 83% by Ag nanoparticles at the bottom. The left two images hold for a flat silicon wafer covered by few hundred nanometer SiO_2 layer, the right two images for a polished Teflon surface.

Gert ten Brink working in our joint group plays an important role. Fig. 3a shows in a TEM image the Ag nanoparticles (NPs) on a thin amorphous carbon support film. All NPs have a similar size of about 13 nm (diameter). We deposited these particles on two distinct types of (flat) surfaces. One type is a silicon wafer that is covered with a few hundred nanometer layer of SiO_2. The other is a polished Teflon surface. When these surfaces are bare they show strikingly different wetting behaviour, see Fig. 3b. On SiO_2 the water droplet spreads nicely, contact angle (CA) is about 52 degrees, showing that this is a hydrophilic surface. On the other hand, Teflon is well-known for its hydrophobic behaviour and indeed we observe a CA beyond 90 degrees (about 112 degrees). When we cover these surfaces with Ag NPs a strong increase in CA is observed, that scales with the degree of coverage (see Fig. 4). For a high coverage of the surfaces with 83% of NPs the surfaces become super-hydrophobic independent of whether the original surface was hydrophilic or hydrophobic. On the SiO_2 the observed CA of about 143 degrees is even slightly higher than the one on Teflon of about 138 degrees. Important to note that a surface coverage of 83% does not mean that the Ag NPs nicely align next to each other in a monolayer. In this case the height of the NP film can readily extend to three times the diameter of the NPs. A cover-

age of 83% means that when the surface is imaged from the top that still in projection 17% of the surface is not covered by NPs.
It is also important to know that Ag itself is hydrophilic. So, Ag itself does not act like a wax layer that repels water. The reason for the super-hydrophobicity is related to the geometry of the NPs on the surface, where water is pinned in the apex underneath the particles with the substrate. So, even for a CA of about 140 degrees the droplets will not roll off the surface when it is tilted. The water droplets will even keep on sticking to the surface when the sample is rotated gently upside down.

This combined effect of super-hydrophobicity and strong pinning is called the rose petal effect, because the same effect is observed in nature for water droplets on rose petals. Understanding wetting behaviour and being able to engineer surfaces (locally, with a relatively cheap method) is of course important for many applications.

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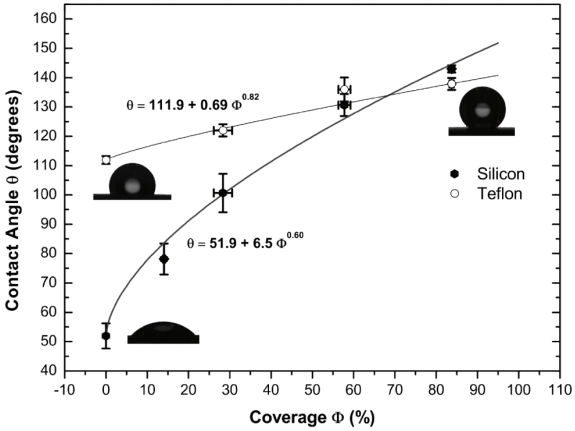


Fig. 4: Static contact angle measured for surfaces covered with different fractions of their total area by Ag nanoparticles. Silicon wafer covered with a thin SiO_2 layer is hydrophilic in its bare state, but with increasing coverage can be made super-hydrophobic. Teflon already start hydrophobic in its bare state, but for high Ag nanoparticle coverages behaves very similar to the SiO_2 covered Si becoming super-hydrophobic.

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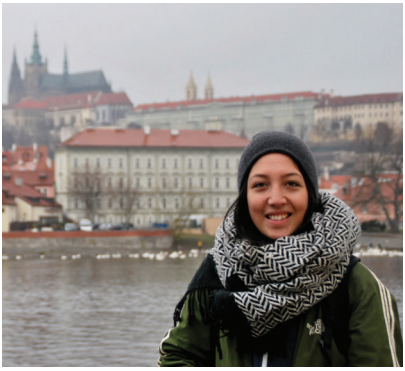
Be part of progress

Life after Francken

By Valerie Siahaan

For those of you who don't know me, my name is Valerie and I used to hang out in the Francken room for hours on end, mostly playing klaverjassen or drinking beer. Aside from that I also did a lot of committees at Francken, including the board of the Beta Business Days, the Borrelcie, and my favorite: the foreign excursion committee. With this committee, I organized an "EuroTrip"-inspired train journey to Prague, Budapest and Vienna, which probably is the most chaotic trip I've ever been on. Funnily enough, one of these cities is where I live now. I am still looking for any leftover Francken stickers, so if you remember where you put them, please let me know!!

My "life after Francken" started in 2017 when I was finishing my master's in Applied Physics and looking for a place to do



the industrial internship. Since it was just a 3-month internship, I decided that this would be a great opportunity to go abroad. Through professor Wouter Roos, I got in contact with Zdenek Lansky, group leader of a biophysics lab at Biocev in Prague, one of the most prestigious biotechnology institutes in the Czech Republic.

Within a week I got an internship and one month later I was on a plane to my new hometown.

Biocev was founded in 2008 and Zdenek Lanksy joined in 2015. This means that we are one of the youngest labs in the institute, but for two years in a row we were in the top 3 of the institute's best publications of the year (mine won last year!). When I moved to Prague for the internship, I didn't plan on staying for more than those 3 months, but when I arrived I fell in love with the city and felt like I was in the right place in the lab. After my internship, I went back to Groningen to finish the remainder of my master's and in the summer of 2018 I moved back to Prague to work in the lab for one year, but last year I caved and finally decided to start a PhD.

Zdenek (my P.I.) is a great researcher and an even better supervisor, he is remarkably smart and positive. Next to Zdenek (physicist), we have Marcus Braun (biologist) as the second P.I.; together they form an amazing team full of knowledge from both their backgrounds. Their positivity and input is what makes me improve my work and I believe that their enthusiasm plays a big part in the success of the lab.



Figure 2: Valerie with her colleagues from Biocev in Prague

In our lab, we work on cytoskeletal networks, the filaments that form these networks and proteins and crosslinkers that bind to these filaments. We use (single molecule) fluorescence microscopy and optical trapping in combination with mathematical modeling to investigate biological processes. My work focuses on the microtubule-associated protein (MAP) tau (mostly famous for its involvement in Alzheimer's disease). We discovered that tau binds to microtubules in a different way than always assumed, which opened up a whole new understanding of how tau and other MAPs regulate microtubule associated processes. My first paper was published in September 2019 (definitely read it if you're interested: Siahaan et. al., Nature Cell Biology, 2019) and right now we're working on what I believe will be an even bigger story, so stay tuned!

I can recommend anyone who is looking for an internship (or even a PhD) to take a look at the work we do in the lab and contact me anytime if you have any questions. Also, if you're visiting Prague and would like some recommendations about the city or want to grab a beer, let me know!

Francken's winter recipes

Special thanks to, Wouter Haarman, Tabitha Minett, and the (grand)mothers of Emma, Guido, and Sibren

During the cold winter months, we could all use an extra bit of warmth. Something that brings joy in the hearts of the editorial board is good quality food. We'd like to present five recipes for you to get you through the winter. So, put on your cooking apron, get your spices out of the closet, and follow these instructions for an amazing dinner.

Wouter's Glühwein

One can of course not start cooking while completely sober. Therefore, you'll have to start with the following recipe so you can stay hydrated before, during, and after cooking.

Ingredients:

1. 2 bottles of ready-made glühwein
2. 2 Oranges
3. 6 staranijs (*Illicium verum*)
4. 8 cloves

Preparation:

Put your glühwein in a pan and carefully heat it. This could be done on a stove, put preferably on a warming plate. Slice oranges in quarters and add it to the wine. Add the staranijs and clove and stir everything together. Make sure to keep the temperature low, you don't want your alchohol to evaporate!



Tabitha's vegan sausage rolls (16 rolls):
An essentials snack for Brits, sausage rolls are sure to keep you going through a rough day, or fix you up after a night of drinking. They are so tasty and popular that LadBaby wrote a song about them (reaching UK Christmas Number 1 in 2019).

Ingredients:

1. 1 onion
2. 2 stalks of celery
3. Olive oil
4. 500 g chestnut mushrooms
5. 2 cloves of garlic
6. 1 tablespoon Dijon mustard
7. 100 ml white wine
8. A pinch of sea salt
9. A pinch of ground black pepper
10. 80 g fresh white breadcrumbs
11. 2 sprigs of fresh thyme
12. 640g ready-rolled puff pastry
13. Oat milk
14. 2 teaspoons sesame seeds

Preparation:

1. Preheat the oven to 200°C. Line a large baking tray with baking paper.
2. Finely chop the onion and the celery. Fry the onion and celery in olive oli over a medium-high heat. Cook for 10-15 minutes. Meanwhile, finely chop the mushrooms.
3. Peel and crush in the garlic, then add the chopped mushrooms. Cook for a further 5 minutes, or until the mushrooms start to soften. Add the mustard and wine, season with salt and pepper, then reduce the heat to low. Cook for 5 to 10 minutes, or until all the liquid has boiled and bubbled away. Set aside to cool.
4. Add the cooled mushroom mixture and breadcrumbs to a large bowl. Add the chopped fresh thyme leaves. Stir well to combine, then season to taste.
5. Cut the sheets of puff pastry in half lengthways so you have four equal-sized pieces. Spoon a quarter of the mushroom mixture along the middle of one length of pastry, moulding it into a long sausage shape with the back of a spoon.
6. Brush the milk along the pastry edges, then carefully fold one of the long sides of the pastry up over the filling. Press the edges to seal. Repeat with the remaining ingredients until you have four long rolls, then cut each into four pieces.
7. Place the rolls on the baking tray, brush with the milk and sprinkle over the sesame seeds. Pop on the bottom shelf of the hot oven for 25 to 30 minutes, or until golden, then serve!



Sibren's mom's Snert (Dutch pea soup), 4-5 people:

A small disclaimer, do not underestimate this meal! Even though it is soup, two bowls of this are a main course on its own and might fill you up completely.



Ingredients:

1. 500g of split peas
2. 2 leeks
3. 2 winter carrots
4. 250g of broth
5. 2 bacon rashers
6. 2 sausages
7. 1 pig's rashers
8. About 2cm of ginger
9. 3 teaspoons of curry
10. 1 teaspoon of turmeric
11. 1 tablespoon of sambal
12. 2L water

Preparation:

1. Rinse the split peas and start cooking them in their water.
2. Wash the vegetables, and cut them into pieces. Add the vegetables to the already cooking split peas.
3. Cut the bacon and pig's rashers and add them to the pan.
4. Keep stiring until it starts boiling. When the mixture is boiling turn down the gas and let it slowly continue boiling (preferably using a flame distributor).
5. Peel the ginger, add the peeled ginger, together with the all the spices and broth, to your mixture and stir everytone togehter.
6. Add your sausages and let everything boil for at least an hour. From time to time, stir the soup to prevent it from sticking to the bottom.
7. Remove the sausages and cut them in slices. Afterwards, put them back into the pan.
8. Lastly, remove the ginger from the soup and you are ready to serve!

Guido's mom's Italian brasato, 4-5 people:

If you want to opt for a fancy dinner, then this Italian recipe is for you!

Ingredients:

1. 1kg ribeye roast
2. 1L red wine (Barolo Nebbiolo)
3. Two cloves of garlic
4. 2 finely cut onions
5. Salt
6. Pepper
7. Rosemary
8. Cloves
9. Sage
10. Nutmeg
11. Extra-virgin olive oil
12. Dried Prunes



Preparation:

1. Let the above raw ingredients (excluding the olive oil and the prunes) marinate overnight (10-12 hours), evenly submerging the ribeye.
2. Remove the ribeye and dry it with tissue paper before placing it in a large and tall pot and pouring 1-2cm of olive oil in the pan. Keep the sauce in which the meat was kept separately.
3. Turn the roast over until it forms a thin crust where it comes in contact with the boiling olive oil.
4. Add all of the sauce in which the meat was left overnight, then cook for another 1.5-2 hours (depending on your preference), continuously turning the meat over to prevent it from sticking to the bottom of the pan. You may need to add some water if the wine evaporates before it is finished cooking.

Before serving, cut the ribeye into thin slices, then add some of the sauce/wine in which it was cooked and dried prunes. Maybe also some salt if it needs it.

Emma's grandmomther's Italian Crema di Mascarpone:

Then for dessert we'll stay in Italy and have an Italian mascarpone with custard!

Ingredients:

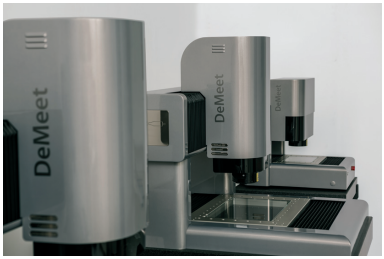
1. 250g mascarpone
2. 3 eggs
3. 6 tablesoons of sugar
4. Cognac (or another similar liquor)

Preparation:

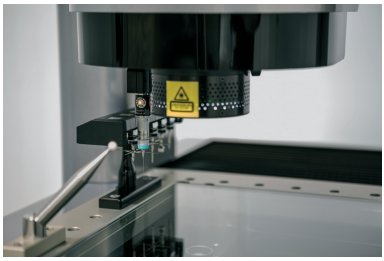
1. Separate the whites from the yolks.
2. Add the sugar to the yolks and whip that until the sugar is not grainy anymore.
3. Add the mascarpone to the whipped yolks and mix it thoroughly.
4. Whip the egg whites in another bowl until they are firm.
5. Add the egg whites to the rest of the ingredients and mix it; try to make sure that the cream stays airy.
6. Add a splash of cognac.
7. Enjoy!

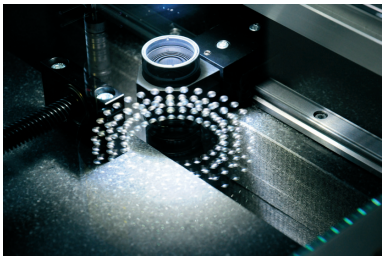


The Francken Vrij wishes you a happy winter and hopes to see you soon!











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