

WUR from within: straight, sharp, transparent

No 17

Resource

JUNE 2024 VOLUME 18

The journalism platform for all at Wageningen University & Research

Lionfish sees
colour and UV

Coalition agreement
disaster for students

Dutch cotton
from greenhouses

VeSte biggest
party again

Illustrations bring
science to life

Activists and Board
still miles apart | p.14



Contents

NO 17 VOLUME 18



12

How do
climate obstructors
operate?



22

Removing PFAS
from the
environment



24

'We are heading
for room shortages'

5 Platform to
support students

6 Dairy farm incomes
fall due to manure
rules

8 Live & Learn:
'I remain cautious'

18 Nature education

30 Meanwhile in India:
Elections

Read the latest news and
background stories at
resource-online.nl



FOREWORD

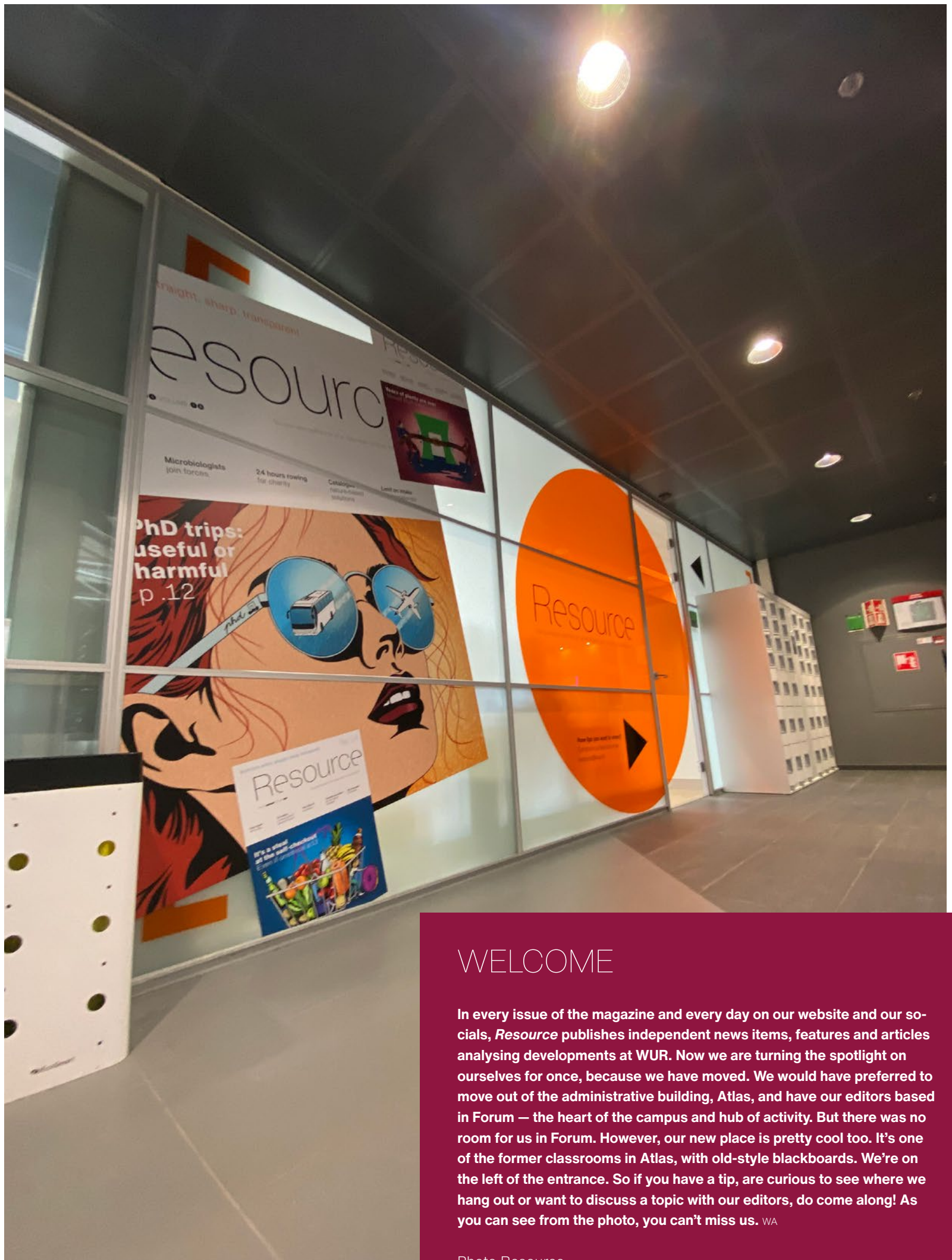
If only

If only we had listened to Einstein. 'If we can't achieve honest cooperation and honest agreements with the Arabs, then it seems we have learned nothing from all the suffering we have endured for two thousand years'. I read these words, written in 1929 about the future Israel, in his biography. It seems a world away, but his comment has resonated on campus in recent weeks. On page 14, we attempt to analyse the situation with the protests on campus.

Meanwhile, research and education continue as ever. Martijn Duineveld, for instance, has started a study of climate obstructors (page 12). In a time when WUR experts are very worried about the climate and biodiversity, such climate obstructors are a huge frustration. They are one reason why it is so difficult to get new policies off the ground: opponents block changes and deny there is a major climate problem, while big investments continue to be made in fossil infrastructure projects. Let us hope there doesn't come a day – when the climate situation has got even worse – when we say: if only we had listened to the scientists.

Willem Andrée
Editor-in-chief





WELCOME

In every issue of the magazine and every day on our website and our socials, *Resource* publishes independent news items, features and articles analysing developments at WUR. Now we are turning the spotlight on ourselves for once, because we have moved. We would have preferred to move out of the administrative building, Atlas, and have our editors based in Forum — the heart of the campus and hub of activity. But there was no room for us in Forum. However, our new place is pretty cool too. It's one of the former classrooms in Atlas, with old-style blackboards. We're on the left of the entrance. So if you have a tip, are curious to see where we hang out or want to discuss a topic with our editors, do come along! As you can see from the photo, you can't miss us. ^{WA}

Photo Resource

Lobby for rent rebate for student houses

Kences, the centre of expertise on student accommodation, is calling for grants and a new kind of rent rebate to boost the construction of student houses with shared facilities. At present, it is often more financially attractive for investors to build self-contained studio flats.

How to encourage the construction of what are termed 'non-independent units' (i.e. student housing with shared facilities such as a kitchen and bathroom) is an important issue in the Letter to Parliament on the 'state of student accommodation', which is due to be discussed in the Dutch Parliament soon.

In the Netherlands in recent decades, far more studio flats have been built for students than houses with shared facilities. That is partly because the rent

rebate system acts as a financial incentive for studio flats: investors can ask much higher rents for studio flats than for rooms in a shared student house.

Accommodation grant

That needs to change, says Idealis director and Kences board member Bart van As. 'Although this is not a problem in Wageningen, as it happens: we have made an agreement with the municipality that 60 per cent of what we build will be non-independent units and 40 per cent independent units. That agreement applies to everyone who wants to build accommodation for students in Wageningen, not just us. It is based on the idea that having flatmates is good for your wellbeing as a student.'

Other university towns don't have such agreements, says Van As. To ensure

more 'old-style' student houses are built, Kences is lobbying politicians for grants for the construction of new student housing complexes with shared facilities so that property developers will have a financial incentive to build such complexes.

Kences is also advocating a new kind of rent rebate for the occupants of non-independent units, which it calls the accommodation grant. Van As: 'The accommodation grant is like the rent rebate, but specifically for students who live in a house with shared facilities.' LZ



SER nominates jeans thesis

The Social and Economic Council (SER) has selected three Master's theses for the SER thesis prize. One is Eveline Nales' thesis on recycling clothing. Nales recently graduated in Environmental Sciences at Wageningen. For her Master's thesis, Nales investigated sustainability in the clothing industry, taking jeans as an example. 'I used the True Cost Accounting method to see whether it is a good idea to aim for as high a percentage of recycled material in new clothes as possible,' she explains. SER will announce the winner on 20 June. DV • Photo Eveline Nales

VeSte biggest in Student Council

The votes have been counted in the Student Council election. VeSte will get eight seats, S&I three and CSF one. Rector magnificus Carolien Kroeze presented the election results last Tuesday on the stage in Forum. Of the 12,222 students eligible to vote, 3,722 actually cast a vote (over 30 per cent). 2,321 of the votes went to VeSte, 937 to S&I and 447 to CSF. 'I'm very pleased we had an election again after it didn't go ahead last year,' said Kroeze before announcing the results. 'It is important for students to get a say in what direction the university takes.' The Student Council election didn't go ahead last year because there were only 11 candidates for the 12 seats on the council. A 12th Student Council member was found eventually. LZ

50

Fifty years minus four weeks. That is how long education and research assistant Jurrie Menkman will have worked for WUR when he retires this summer. He would have celebrated 50 years working for WUR on 15 August this year. Menkman: 'But my 67th birthday is on 15 July and I have to retire when I turn 67. If it was up to me, I'd happily carry on one more year.' ^{DV}

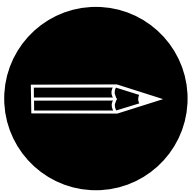
Platform to support students

A new online platform is being developed for students who need extra help. Students with functional limitations, mental health issues or caring duties can use the platform to form communities, organize events and find information about facilities and support services.

The platform will be set up by three students: Wietske Oosterkamp (Forest and Nature Conservation Master's student) and Imke Grutters and Aline Zamoro Martinez (both Nutrition and Health Master's students).

It was the university that came up with the idea for the platform, says Oosterkamp. 'There are a lot of facilities for students who need extra help but it can be hard to find the right information. If you don't know certain services are available, you can't make use of them.' ^{LZ}

Read more on resource-online.nl



LETTER TO THE EDITOR

'Coalition outline agreement is death knell for students'

The outline agreement is a disaster for students, says Steg Snelders of Student Council party VeSte.

'We might as well give up on future generations of students. That is the message from the coalition parties in the outline agreement they recently presented.

Students are lonelier, experience more stress and are more worried about their financial situation than ever before. Possible solutions for dealing with this are making justifiable study delays acceptable, having a basic grant that is big enough given the current state of the economy, and helping student societies to combat loneliness.

But instead of an outline agreement that offers solutions for students' problems, the new government plans to introduce a prolonged-study fine that means your tuition fee goes up by 3,000 euros if you get

more than one year behind in your degree studies. As a result, there will be even more exam stress and even less interest

'There will be more exam stress and less interest in doing a year on a committee'

in doing a year on a board or committee. That will harm student life — especially in Wageningen, where activities are particularly dependent on student societies. If delaying graduation becomes so much more expensive, we fear lots of students will decide not to do that year on a committee or board after all.

The proposed decision to reduce the basic grant by 35 per cent will also increase the financial pressure on students. Students will have to work more, or borrow more money, at rates that went up five times last year, which will only cause

more problems later on.

Together with the university, VeSte is looking at how to minimize the impact of these measures and keep WUR a place where you are allowed to make mistakes from time to time and where you have enough opportunities to develop in extra-curricular activities.'



Geert Wilders (PVV), Dilan Yesilgoz (VVD), Caroline van der Plas (BBB) and Pieter Omtzigt (NSC) during the presentation of the outline agreement. ♦ Photo ANP Koen van Weel

Niels Smith sports grants for lacrosse and badminton

Talented sportspeople doing a degree at WUR can apply for support from the University Fund Wageningen. This year, there were seven applications. The winners were selected by two jury members who previously won grants themselves. Iepe Bouw and Kelly van Buiten were the lucky winners. Kelly van Buiten plays in the Dutch youth squad for badminton. 'Badminton is a mid-sized sport. We have a lot of clubs in the Netherlands but few elite players, certainly compared to the rest of the world. I hope I will get promoted to the senior squad after the Olympic Games in Paris — which unfortunately comes too early for me.'

Iepe Bouw is a face-off specialist in lacrosse. His sport will be in the Olympics for the first time in 2028 in Los Angeles, but he doesn't want to think too much about that yet. 'We have to prove we belong there as a country, and we need enough teammates to have that Olympic dream... But I would find it really awesome!' *DV*



Dairy farms face big fall in income with manure rules

The Dutch dairy farming sector will be hit hard by the change in the manure rules. This is shown in an analysis by Wageningen Economic Research (WECR) of the Manure Market Action Plan published recently by the Ministry of Agriculture. The analysis was commissioned by the Dutch Dairy Association (NZO). 'Going back to Brussels' to reverse the situation is not a promising option.

Dairy farmers will soon have far less scope to spread their manure on their own farm once the derogation ends and new rules on buffer zones and nutrient-polluted areas come into effect. As a result, the price for removing manure has basically tripled. That means a loss in revenue of 27,500 to 34,500 euros per year for an average dairy farm, the

equivalent of 30 to 40 per cent of the farm income. If manure prices increase further, which the WECR report calls 'far from unthinkable', the loss of income will also be greater. There is hardly any understanding or support for the policy, notes the report.

WECR also looked at what politicians call 'going back to Brussels'; in other words lobbying to get another derogation (meaning more manure can be used after all). The institute notes that a Dutch plan to keep some form of derogation will probably only succeed if it meets two conditions the EU has long been harping on about: 1) compliance with the obligations on water quality; and 2) making sure there is a reduction in manure production / livestock numbers. *ME*

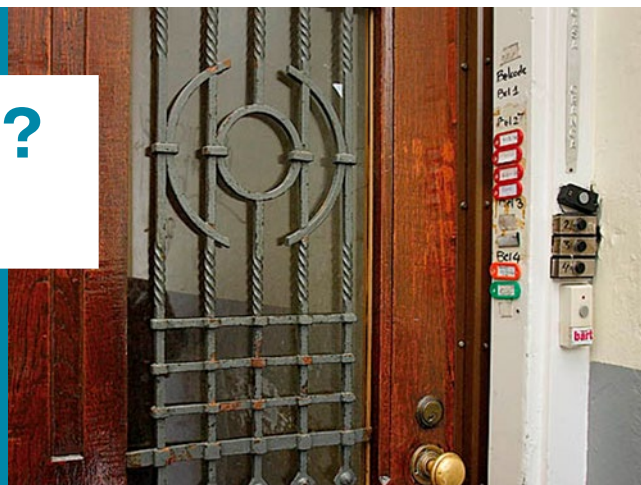
(Advertisement)

Change subscription?

Scan the QR code and submit your change.

(only for Idealis or INFacility student houses)

Resource



LIONFISH

CAN SEE COLOURS AND UV

The lionfish does not just do well in aquariums; The tropical fish with its striking (and poisonous) spines is also one of the most successful invasive species in the world's oceans. How does it manage that? Perhaps because the fish sees both colours and ultraviolet (UV) when it is hunting for appropriate prey, suggests PhD candidate Elizabeth Philips. Text Roelof Kleis Photo Shutterstock



The lionfish normally goes hunting at dusk and at night, when an ability to see colours doesn't help much. But there are signs the fish also hunt during the day. 'And being able to see colours is an advantage if you are out hunting then,' says co-supervisor Alexander Kotrschal. 'Coral reefs are full of colour, and the fish that live in them are usually brightly coloured too. UV light in particular is important.'

Many coral reef fish use UV to recognize one another. Kotrschal: 'They have UV markings on their body that they use to communicate passively. The colour pattern is often the only feature that distinguishes one fish from another. Most daytime predators in coral reefs can't see UV light, so the UV serves as a kind of secret communication channel for reef fish. If the lionfish can hack into that channel, that might explain why it is so successful in hunting small fish.'

Reward

To prove the lionfish have colour vision, Philips first demonstrated they have the right equipment to let them see colours. Genetic analysis showed these fish have genes that code for several photoreceptors, the proteins in the retina that respond to light. But that alone is not enough. Kotrschal: 'It could be an evolutionary legacy, so you have to show

the fish does something with that visual information.'

Philips therefore carried out behavioural experiments. She bought several lionfish in a pet shop (giving them names such as Jaws, Luther, Nala, Sarabi, Scar

'Most daytime predators in coral reefs can't see UV light'

and Simba) and taught them to distinguish between blue and green using a classical conditioning test (rewards for desired behaviour). She used the same approach to test their ability to see ultraviolet.

So lionfish are able to use colours and UV when hunting prey. But do they do so in practice? And does this ability explain their success as a colonizer in the Mediterranean, which doesn't have

any coral reefs? Kotrschal says that still needs to be investigated. A new PhD candidate is now assessing the impact of lionfish on biodiversity in the Mediterranean.

Not dangerous

If anyone is having second thoughts about swimming in a sea full of lionfish this summer, Kotrschal can put their minds at rest. 'The fish are not dangerous at all. The spines may look dangerous, and they are indeed poisonous, but nothing happens if you leave the fish alone. They can't actively stab you. You are also not likely to step on them by mistake as they normally swim at depths of over three metres.'

Elizabeth Philips received her PhD on 7 May. She was unable to talk to Resource herself due to circumstances.

[Live&Learn]

A botched experiment, a rejected paper: such things are soon labelled as failures in academia. As for talking about them – not done! But that is just what WUR scientists do in this column. Because failure has its uses. This time, we hear from Maslim, a PhD candidate in Aquaculture and Fisheries.

Text and illustration Stijn Schreven

‘For my PhD research I wanted to collect skin samples from leatherback sea turtles in Sumatra and Papua, in order to study their population genetics. Because my PhD fell under the WIMEK graduate school, two external reviewers had to review my research proposal.

Whereas the first reviewer approved our proposal, the second wrote an email to the director of WIMEK with the feedback. Normally, feedback is just included in the document, so this was very unusual. This reviewer told the director that I had not contacted the partners in Indonesia about my plans, and was afraid my project would ruin their project in the area. The reviewer also said that it would be difficult, if not impossible, to get permits to export samples. Finally, the person warned the director that I may also not have contacted other partners in the region.

It was clear to me that this reviewer wanted to show their good connections and power. I was shocked, as was my supervisor.

Luckily, my supervisor trusted and supported me. We talked to our partners on the sites that the reviewer mentioned. We agreed there had been some misunderstanding, and decided to drop

‘This reviewer wanted to show their good connections and power’

our plan to take samples there, to avoid duplication and problems. After that, we responded to the feedback, and WIMEK approved the proposal. Sometimes in our field of expertise, there is someone who wants no competition and wants to be on top. You just have to accept that such people exist, and for me, avoiding confrontation with them is the best policy. Even in writing this story, I am cautious.’



‘Plant-based plus fish’ keeps your brain healthy

PhD candidate Annick van Soest studied which combinations of food and nutrients help the brain age more slowly. She will be defending her PhD at the end of June.

Van Soest looked at brain health in the context of the EAT-Lancet diet, which is both healthy for humans and sustainable for the planet. ‘Our research shows that the closer people keep to that diet, the more slowly their cognitive health deteriorates. We saw an effect within just two years.’

That is not surprising, explains Van Soest. ‘That diet contains all the nutrients we know to be important for healthy cognitive ageing: some fatty acids from fish for the omega-3, lots of fruit and vegetables for the antioxidants and polyphenols and some animal products for vitamin B12. That diet also has a lot of wholemeal products, nuts, vegetable oil and pulses for vitamins B and E.’

Plant-based plus fish

Van Soest used the same data set to analyse the effect of the EAT-Lancet diet and the association between a plant-based diet and cognitive ageing. ‘We didn’t find a positive effect on healthy cognitive ageing for a completely vegetarian diet. That is probably because you are then not getting the omega-3 fatty acids from fish. People who eat a plant-based diet

‘We didn’t find a positive effect on healthy cognitive ageing for a completely vegetarian diet’

with a bit of fish do experience healthy cognitive ageing.’

A lot of research has been done in the past on the MIND diet, a variant on the Mediterranean diet that was designed to boost healthy cognitive

ageing. Van Soest: ‘That diet is good for brain health but it contains more animal-based products than the EAT-Lancet diet, which makes it less sustainable. Now we know the EAT-Lancet diet is good for healthy cognitive ageing, we can choose a diet that is both sustainable and healthy.’ DV

Dutch cotton comes from greenhouses

Cotton doesn't grow in the Netherlands. It is too cold here, even with climate change. So the fashion industry depends on countries such as India, China, Australia and the US. But could cotton maybe grow in a greenhouse? WUR researcher Filip van Noort has shown that it can. Text Roelof Kleis

Thanks to collaboration with clothing producer G-Star, the first pair of blue greenhouse cotton trousers has come off the production line. G-Star is promoting the sustainable greenhouse cotton as Home Grown Denim. It could have been called Nederkatoen (Dutch Cotton), confirms Van Noort, who made a name for himself previously with Nedervanille (Dutch vanilla). 'But I suspect G-Star is thinking of the international market.' Although, on that market, 'home grown' will suggest cotton from your own country.

Free of pesticides

Van Noort's cotton is genuinely different to the imported fabric. Not only is it grown on Dutch soil, but it is grown in a greenhouse under strictly regulated conditions, free of pesticide and with maximum reuse of rainwater. Even the word 'soil' is not quite accurate. Some of the 100 plants in the WUR greenhouse in Bleiswijk were grown on substrate, and some were grown on rock wool.

'To make greenhouse cotton profitable, production will have to go up and/or the costs will have to go down'

Greenhouse cultivation has considerable advantages. Cotton plants in the greenhouse grow up to four times bigger, produce between 5 and 23 times more cotton, and use about 95 per cent less water, thanks to reuse. Van Noort's plants rely almost entirely on the sun for heat



A pair of trousers is being made in the G-Star workshop using cotton from the WUR greenhouse in Bleiswijk. All that is needed is some blue dye to turn them into Home Grown Denim (as G-Star calls the trousers). ♦ Photo G-Star

and diseases could generally be kept at bay just by using biological pest control. Local production meant big savings on transport costs. It all sounds too good to be true, Van Noort agrees. The facts are right, but there are some downsides to greenhouse cotton too, the most obvious being the costs. 'Greenhouse cultivation is always more expensive than outdoor cultivation,' he says. 'To make greenhouse cotton profitable, production will have to go up and/or the costs will have to go down. And large plants might make for good yields but they make harvesting more difficult.'

So the few pairs of cotton trousers G-Star produced from the first harvest (in the Netherlands) are unaffordable. 'I'm pleased with what we've achieved so far,' says Van Noort. Follow-up research is

already under way. 'We are working on a new trial to see if a viable business model is possible for greenhouse cotton in the near future.'

Disruptive

Outdoor cotton farming won't easily be replaced by greenhouse cotton. What Van Noort has in mind is a niche market for sustainable products. 'For me, the value of this project is mainly the disruptive way of thinking it represents. This is a totally different way of growing cotton. Maybe we can learn lessons from it for outdoor cotton farming. And that goes not only for cotton, but also for all outdoor crops that need a lot of water and nutrients.'

PhD theses **in a nutshell**

Life after death

Wild boar are the most important scavengers in Dutch nature areas. That is shown by a study by Elke Wenting of the breakdown process of animal carcasses in De Hoge Veluwe park. Wild boar mainly contribute to the breakdown process, and therefore also the spread of nutrients from the carcasses, in the periods when the boar are most active. Some of the nutrients disappear into the soil. That means the carcasses function as a kind of natural fertilizer. Wenting shows that maize grown in carcass fluid grows up to nine times faster. The mix of elements in this 'carcass fertilizer' differs a lot depending on the animal and species. Research on fallow deer shows the variation is related to the sex and age of the animal. *No life without death* **Elke Wenting** ◀ **Supervisors Frank van Langevelde and Henk Siepel (Radboud University).** RK

New colonists

Bacteria that colonize an agar culture medium sometimes create mini-bacteria. Linda Huijboom shows this in her study of the spread of the well-known pathogenic bacterium *Bacillus cereus*. The spherical mini-bacteria are better able to resist heat treatment than their much larger, rod-shaped parents. It is the first time this phenomenon has been shown. Previously, the production of mini-cells was only known to happen in exceptional circumstances. The mini-cells in Huijboom's experiments can grow into ordinary rod-shaped bacteria. The mini-cells seem to be a trick the bacteria use to grow successfully and survive. *Bacterial colonization of surfaces* **Linda Huijboom** ◀ **Supervisors Tjakko Abee and Erik van der Linden.** RK

The right strips

Strip cropping increases yields and makes more efficient use of nutrients. But the effects are complex. The benefits depend a lot on which crops are grown in combination or in sequence, as research by Zishen Wang from China shows. He experimented with the grains maize and wheat and the nitrogen-fixing plants peas and broad beans. Maize is harvested relatively late, the other three crops early in the season. The harvest time is crucial. Combinations of early and late harvests give higher yields than a monoculture. That is because plants in sequential strip cropping are then better able to capture the available light. They spend more time in the sun and don't get in each other's way. Strip cropping with plants that grow at the same time leads to lower yields overall. *Productivity and resource use efficiency in strip intercropping in the Netherlands*

Zishen Wang ◀ **Supervisors Wopke van der Werf, Tjeerd-Jan Stomph and Jochem Evers.** RK

THE PROPOSITION

PhD candidates explain their most thought-provoking proposition. This time it's Filippo Guerra, who received his PhD on 12 April. In his thesis, he explored the role of the transcription factor *doublesex* in shaping sex differentiation in *Nasonia* wasps. Text Ning Fan



'Only beekeepers are entitled to complain about the weather'

'Humans excel in the art of complaining. We complain about anything and everything all day long, with the weather being a favorite topic. But for me, bad weather isn't worth complaining about: a rainy day may cause traffic jams, but you are still sheltered in your car. Cycling to work on a hot day may be uncomfortable, but you will soon be in an air-conditioned office.'

Having studied insects for seven years and once owned my own apiaries in Italy and with the Wageningen Bee Team, I think the reasons why we complain about the weather pale in comparison to the challenges beekeepers face. If bees stay inside for too long because of bad weather, they may eat up all the honey stored in the hive instead of flying out to col-

lect nectar and pollen. If bad conditions persist, instead of selling honey to make a profit, beekeepers have to buy sugar water to feed the bees. Interestingly, bees probably don't complain about bad weather. If they have enough food, they can rest in their hives. It's the beekeepers who suffer.

Complaining never solves problems, whether it's about the weather or anything else, such as your studies or your research. Even if your experiment fails, you have learnt what doesn't work. There is always something positive to be gained from failure. But what can a beekeeper gain from bad weather? Not much. So, the next time you feel like complaining, just think of the beekeepers who have to cope with bad weather.'

Changing tides

The lack of equity can be found in places you wouldn't directly expect it. Take FOS, for example, the financial support system for student associations. First, a step back. The WUR community is growing every academic year, particularly the number of students. The quality of education and the integrated teaching approach remain a strong catalyst for this consistent development. This increase means a campus with diverse international classrooms and different ideas,

'Unfortunately, the reality might be beyond the horizon due to student political interests shifting towards safeguarding their somehow stable compensation over the years'

thoughts, knowledge and cultures that require reliable representation. There is a wide range of WUR student societies and associations that play a significant role in guaranteeing real and active representation of the student community. The representation goes beyond education issues and includes issues revolving around fun and extra-curricular activities to boost student mental health and wellbeing.

Though there is an elaborate and diverse student representation, the big question remains how long it takes for some new or existing associations, especially for country or continent-based associations, to enjoy the full benefits associated with board roles. A recent article in *Resource* highlighted the possibility of more associations benefiting



Joshua Wambugu

from FOS. Unfortunately, this reality might be beyond the horizon due to student political interests shifting towards safeguarding their somehow stable compensation over the years. I borrow a leaf from my active lifespan of over seven years in the social and political arena at WUR, where heated debates on compensation never cease. Often, the small or less established student associations are less privileged in presenting a strong case to earn equal compensation for their activities, never mind those serving voluntarily on the boards.

It is impressive to witness the changing tides on this delicate topic, and seeing a need for all societies and associations, regardless of their foundation or background, to readjust their annual budget in case the proposed redistribution does occur. Of course, there will be winners and losers. However, the journey to guarantee fairness, equity and a sense of equality across the WUR campus will have gained one step. The DARE spirit – DARE was a three-year project to minimize and tackle discrimination that ended recently – needs to roar silently but strongly in every corner.

Joshua Wambugu (40), from Kenya, is a PhD candidate in the Marine Animal Ecology and Environmental Policy groups. He was a Social Safety Guide with the DARE Project and a member of the project's coordinating team. He loves cooking, hiking and birdwatching.

COLLECTIVE RESEARCHES CLIMATE OBSTRUCTORS

The opponents of environmental policy leave no stone unturned in obstructing it. Climate Obstruction NL, a research network that cultural geographer Martijn Duineveld belongs to, aims to expose the mechanisms at work.



Text Roelof Kleis

We all know that the climate is changing dramatically. There is incontrovertible scientific evidence that humanity is responsible. We also know what kinds of measures are needed to turn the tide. And yet it is hard to get effective climate policy off the ground. Its opponents deliberately obstruct, deny and delay it. A collective of scientists, research journalists and NGOs have joined forces to expose the strategies and structures at work. The initiative for this came from cultural geographer Martijn Duineveld. It was prompted somewhat by chance when, at a party in The Hague two years ago, he heard about the annual technology festival Generation Discover. 'A nice children's festival about sustainability, wind turbines and an energy future in which gas was still indispensable. Organized by Shell. I was outraged. After all we now know about climate change, is Shell really targeting children in promoting fossil fuels?'

That same evening, his indignation turned into a resolution. 'This is interesting, I'm going to research it.' Duineveld read Erik M. Conway's famous book *Merchants of Doubt*, got in touch with an American group of researchers studying climate obstruction, and found allies in his own

country. The outcome is Climate Obstruction NL, a Dutch research network. The book *Climate Obstruction across Europe* comes out this month, and includes a chapter by Duineveld about the Dutch situation.

Isn't science catching up on this very late?

'Yes. There has been a lot of journalistic research on climate obstruction by platforms such as *Follow the Money*. NGOs like Friend of the Earth do good, sound research. And there are also a few studies by transition researchers, which look at the interconnections between the energy industry and the government, and how that creates massive delays and obstructs change. But obstruction research doesn't really exist in the Netherlands yet.'

Why not?

'You can identify several power clusters that are behind obstruction. The major industries and the established elites are examples. But perhaps even more powerful is the cluster of enablers: those who make obstruction possible, whether deliberately or not. Science is among them. Including WUR. For a long time, Wageningen concentrated entirely on

technical solutions to climate problems. Research financiers play an important role there too. European research funds are highly ideological and focussed on technofixes. The money doesn't go to research on how we have become accomplices and co-responsible for slowing down the climate agenda or steering it in a certain direction. The realization that many problems can no longer be solved by technical means is slowly sinking in now – even in Wageningen, fortunately.'

In Climate Obstruction NL, you work with journalists and NGOs. Isn't there a danger of the research being affected by activism and bias?

'The question assumes that there are scientists who can avoid the normative. That's not the case. We all have normative biases. In fact, most scientists are activists. Activists for the status quo. We diligently do our work and are part

'European research funds are highly ideological'



Martijn Duineveld: 'Serious investments are currently being made in fossil fuel infrastructure projects such as the transportation of CO₂ out to sea. That way you restrict the possibilities for saying goodbye to that fossil industry.' The photo shows the first drilling for CO₂ storage under the North Sea, near the sea wall on the Maasvlakte (15 April 2024). • Photo PorthosCO2

of the legitimization factory for established interests. If you manufacture air filters that are claimed to make livestock farming more sustainable, the air might be a little bit cleaner. But you are also legitimizing the continuation of that livestock farming. That is a political choice.'

How do you safeguard scientific impartiality in today's society?

'In October, we'll be running a conference at which we will spell out the expectations of all parties. You've got to be very aware of how knowledge is used or can be misused. NGOs gather knowledge for use in court cases. What counts for journalists is news. Scientists want to document patterns and structures. It's important to know what the various groups are going to do with the knowledge they acquire.'

What is the network going to study?

'Climate Obstruction NL is a network of individual researchers. Some of them look at the traditional forms of obstruction: climate denial and impeding measures. You could call this covert obstruction: acting as though you're going green while most of your investments are in the fossil industry. A second issue is the normalization agenda around the use of fossil fuels. Companies like Shell are very good at greenwashing, one of their approaches being sponsorship and investments in the cultural sector.'

And what are you personally going to do?

'My interest as a cultural geographer is in material obstruction. Currently, big investments are being made in fossil infrastructure projects that we are saddling future generations with. Take the heat networks that are being created

to make use of residual heat from the industry in Rotterdam port. That legitimizes the continued existence of the fossil industry. You legitimize a polluting industry with a heat network. The same goes for investing in transportation of CO₂ to the sea, with which you restrict the possibilities for saying goodbye to that fossil industry. Carbon capture and storage (CCS) can be a good option for cleaning up CO₂, but it is now mainly being used to legitimize existing industries. With these kinds of investments, you colonize the future. We are saddling future generations with the choices we are making now.' ■

Scan the QR code to read the book *Climate Obstruction across Europe* free online.



WUR and activists still miles apart

The occupation of the bridge between Forum and Orion by Wageningen For Palestine activists has entered its fourth week. There is no end in sight. An analysis. Text Roelof Kleis and Willem Andrée • Illustration Valerie Geelen

The activists' aim is clear: they want WUR to break its links with Israeli universities and science institutes. But WUR's Executive Board has no intention of doing this. The two sides have been talking to one another for three weeks but so far that has not resulted in anything more than some concessions. WUR published a list of the Israeli institutions it works with and it will be making two scholarships available for students from conflict zones. The occupation of the bridge is part of a wider trend. Students and staff are increasingly calling on WUR to take a stand on social and political topics. The Executive Board's response is always the same: it is not appropriate for a research and education institution to speak out on such matters. WUR assesses collaborations and projects against its Principles of Cooperation. That assessment doesn't allow for a generic boycott. The stance is not only a matter of principle but also pragmatic. It avoids complex ethical discussions about which countries or regimes it would be acceptable to work with. The war in Gaza is not the only conflict in the world and the Palestinians are not the only people being oppressed.

Report to the police

The occupation of the bridge is good-natured, without the destructiveness that was seen in the protests in Amsterdam. But the tone seems to be getting more combative. In violation of the agreements, there was a blockade of the F&A Next conference in Omnia, and activists entered Forum and Atlas last week. The use of a slogan that equated Zionists with Nazis even

prompted the Executive Board to report the incident to the police as group defamation.

There is also the question of how broad the support is for a boycott. In accordance with the agreements with the Executive Board, the encampment on the bridge is small in scale. About 300 students and staff joined the walkout on 13 May and the demonstrations usually get around 50 people. The vast majority are staying silent. The Board undoubtedly draws strength from this fact in its decision to stick with its stance.

Another question is how long the occupation will go on for. As long as the demonstrators keep to the rules, the Executive Board will see no reason to intervene. The activists have shown they have plenty of stamina. Even so, their ultimate goal of breaking all links with Israeli institutions seems a bridge too far. ■

Wednesday 15 May

The protest starts. Demonstrators put up tents on the bridge between Forum and Orion. That same day, they have talks with the Executive Board. At the end of the day, staff give the students encouragement and hand out coffee and ice cream.





Tuesday 21 May

Wageningen For Palestine activists announce a new action in partnership with XR Wageningen, XR Justice Now!, Scientist Rebellion Wageningen and End Fossil Occupy WUR. They plan to disrupt the Food & Agrotech Summit on the Wednesday morning.

Wednesday 22 May

Around 9:30, demonstrators obstruct access to the Food & Agrotech conference in Omnia. 'I am not happy about this,' says WUR spokesperson Jan-Willem Bol. 'We have rules for protests, one of which is that demonstrators are not allowed to disrupt events. By blocking access to the conference for attendees, the protestors are breaking these rules.'

Monday 27 May

The protesters take action again around noon. In addition to a walkout, they hold a brief protest in Atlas that some believe goes too far. There is a call to prayers, but an offensive slogan can also be heard: 'Zionists are all the same; Nazis by a different name'. WUR condemns the slogan. Staff who are united in a pressure group also get involved in the debate. The latest statement from the Executive Board on Wageningen's collaborations with Israeli institutions does not meet with approval because it fails to explicitly reject or accept the activists' demand to break links with those institutions.



Friday 17 May

WUR meets the demonstrators' demand to take on students from conflict zones and makes two scholarships available.

Tuesday 28 May

WUR makes a report to the police for group defamation. 'We think the slogan "Zionists are all the same; Nazis by a different name" crosses a line,' says the spokesperson.

Tuesday 4 June

When this issue of *Resource* went to press, the demonstrators had announced another walkout for Wednesday 5 June. They say WUR's argument – the need to maintain academic freedom – is not sufficient reason why links with the Hebrew University should not be broken.

Thursday 16 May

WUR publishes a list of collaborations with Israeli science institutions, which was one of the activists' demands.

Wednesday 29 May

The activists want the Executive Board to apologize for reporting them to the police for group defamation. 'We have asked the Board to make its excuses once it becomes clear this police report is going nowhere. They are going to think about it.' A WUR spokesperson lets it be known there was no discussion about excuses and no call for excuses to be made.







GUARD

If you visit Belmonte arboretum, you may suddenly come face to face with this guard. This work by French artist Beya Gille Gacha is called *Sentinelle*. It is one of the eye-catching works in the 12th edition of the art exhibition *Beelden op de Berg*. The exhibition opened last weekend and will run until 15 September. Admission is free. Fourteen international artists created works inspired by the theme 'Decolonizing Botany'. Colonialism had a big influence on the food we eat and the plants in our gardens. The Belmonte arboretum is a good example. Gille Gacha's guard watches over this legacy serenely. ^{RK}

Photo Guy Ackermans

The human/nature relationship

Why walking interviews?

Reineke van Tol is both a teacher and a PhD candidate in the Forest and Nature Policy chair group. She has developed the 'outdoor course' Wild Perspectives, and is doing research on the education impact of the course in an appropriate fashion: through walking interviews. *Resource* went for a walk with Van Tol to find out more about that. Text Marieke Enter • Photo Guy Ackermans

'Relational education is about questions such as: who are you in relation to nature, what is your attitude to it and what do you do with it – what is your role in the world, with all the problems we face, like climate change and loss of biodiversity? And how can you contribute to a better world without going under? With Teacher of the Year Ignas Heitkönig I've developed the summer course Wild Perspectives to look at these kinds of questions. The students spend a week outdoors in nature, and the whole week is all about changes of perspective: to think in new ways about nature, and to look at nature with other, non-human eyes. 'Most nature education is *about* nature, but doesn't involve nature. In Wild Perspectives we do it differently. For example, we walk to the Utrechtse Heuvelrug in two days, a kind of journey through time during which we ponder the development of the planet and the place of humans in that. We make use of writing workshops and meditation and theatre techniques to practise adopting a

non-human perspective. And at the end of the week, the students give a "storytelling performance", often with music and other art forms.

'We have taught this course now for the third year running. Part of my PhD research is research on the impact. My research question is about precisely what the learning experiences did: whether students undergo transformations. To find that out, I invite them to go for a walk to the places where they had learning experiences and acquired – I hope, at least – meaningful memories.'

Going outdoors

'I looked for a research method that not only provides the human/scientific perspective, but also the relational one with regard to nature. So I thought: I must go outdoors with my research participants — out into nature, on foot.

Hardly anyone does that. Since the Covid pandemic, lots of interviews take place online, which is handy for recording and transcribing them. But you don't generate the same memories and emotions online as you do outdoors, at the locations where the learning experiences took place.

'I have three different courses as case studies, all of which were run near Wageningen. With every student, I went back to the place used for "their" course. I find that this taps into different levels of interaction than "regular" interviews do. And I stimulate that too, through micro-phenomenology, as it is called: appealing to embodied experience and emotions using meditation techniques. I invite the students to sit down in the woods or fields, to focus their attention on their breath and what they can hear and smell around them. And then to go back in time, as it were, to the experience they had at this spot before.

'With this approach I am trying to bring the unconscious into my research as well'

‘Some researchers wonder if the setting doesn’t influence an interview too much. But I do that quite deliberately so that people reflect more deeply and draw on their feelings – with this approach I try to bring the unconscious into it as well. So that’s an interesting research question right there: is this permissible? Of course I do pay attention to consistency in the method. I go back to the course location with all my participants, I do the same meditation every time, and I ask the same questions.’

Grateful

‘Most students say that this approach took them right back to the previous experience, including the feelings that went with it. So it wasn’t just a mental exercise. They also said that walking put them at ease so they felt free to talk about very personal things. That is certainly relevant in this context, because these courses often stirred up deep emotions. Several students thanked me at the end of the interview because they were able to relive the valuable experience they had on the

course. I thought that was quite special. It seems that I am doing something that matters to students. The fact that I’m contributing to knowledge about walking interviews is a nice side benefit. Not much is known yet about walking interviews as a research method: I’ve only found one or two academic articles about them that I found solid enough to use.

‘I think walking interviews are of particular interest to WUR. Much of our work is about physical things such as nature or agriculture, which involve research locations you can go to and interact with. And it’s so simple, taking people out of doors, but it does lead to a different kind of conversation. The same goes for education. A nature course taught outdoors,

Matthijs Schouten: ‘Let us love’

Van Tol has had a passion for the subject of relational nature education ever since her Master’s thesis. She wrote that thesis about NatuurWijs, a foundation established by the Dutch Princess Irene, which gives children the experience of immersion in the nature ‘that they are part of’ (in the foundation’s words). Her supervisor was professor of the Ecology of Nature Restoration Matthijs Schouten, who retired in 2021 and recently also retired as the ‘in-house philosopher’ at the Dutch forestry commission Staatsbosbeheer. At the symposium to mark the occasion, he gave a moving lecture about the relationship between humans and nature, ending with ‘let us love’. The Dutch text can be read on natuurcollege.nl.

like Koen Arts’s course Anthropology of Outdoor Skills, has a very different effect than a nature course taught in a lecture theatre or classroom.’ ■



Teacher and PhD candidate Reineke van Tol (right): ‘I think walking interviews are of particular interest to WUR’.

Experiencing nature 'in the laboratory of the mind'

Should you teach *about* nature or *with* nature? And how do you go about it? These are much-discussed questions in higher education at the moment. Wageningen Pre-University, which provides in-service training for teachers, ran an evening recently with the biologist, writer and explorer Arita Baaijens. Text Marieke Enter • Photo Resource

Baaijens spent years travelling solo across the Sahara and undertook several expeditions to remote regions of Siberia and Papua New Guinea. A more recent initiative is her effort to change the 'rather bossy' relationship between humans and the North Sea by giving the North Sea more of a say in what goes on there. To this end, she consults experts – including some at Wageningen – on what the sea and its sea life would actually want. This experience gave Baaijens new perspectives on the interconnections between humans and nature. She is keen to share these – especially with teachers – as well as the astonishment, frustration and false assumptions she caught herself experiencing over the years. 'I have learned that there are countless ways of understanding the world. The same goes for how you explain that world to your pupils. For a sustainable future we

need a new image of humanity and of the world we live in. So the way we teach is important.'

Imagination

Baaijens started her story with a warning. 'This evening will make great demands on your powers of imagination. You are going to hear things that will make you think, "hmmm..." That internal sceptical voice is something to cherish. But switch it off for the next two hours. Allow yourself some mental space. See this room as a laboratory of the mind.' And then she embarked on her talk about her travels and their effect on her worldview and self-image.

'In the desert I had to reinvent my identity. All alone, without anyone around me who had any expectations of me, the woman I had thought I was for 32 years disappeared. It turned out that all that time I was mainly focussed on meeting expectations. But the desert had no expectations of me. The only person who decided what was right or wrong, who could set my moral compass, was me.'

'The process continued in Siberia, which challenged me too. The residents of the Altai mountains have a totally different view of nature than the one I was used to. There, nature just is. It doesn't belong to humans, it is its own boss. Non-human organisms such as animals, plants and fungi are seen as kin, as co-creators of the world. And phenomena such as nature spirits are the most normal thing in the world to people there. I found it fascinating and avidly absorbed what the people had to tell me. But to actually believe that their worldview was "true" and mine wasn't? I couldn't do that then. I too was thoroughly imbued with Western thinking. Whereas of course, just because I can't see or experience something, it doesn't mean it doesn't exist.'

Realities

And with this, Baaijens arrived at some fundamental questions: whose reality counts, who defines reality, and why? She clarified that fundamental issue with reference to questions that arose when she and a research team including Wageningen scientists wanted to create an alternative map (a 'deep map') of the Altai



For a literal change of perspective, Arita Baaijens got teachers to stroll across the campus with a little mirror.

‘Other cultures and frames of reference are not failed attempts to become and to think like us’

valley, which is held sacred in Siberia. What do you put in and what do you leave out? Baaijens pointed to the different ways of classifying landscapes used by the Wageningen cultural geographer Maarten Jacobs: in terms of physical characteristics (a ‘matterscape’), factors of power (a ‘powerscape’), or spiritual dimensions (a ‘heartscape’).

‘So the question is not: who is right here?’ was Baaijens’ summary. ‘The question is: which reality do you want to embrace, which starting point do you want to adopt? My experiences in the Altai Valley and Papua New Guinea taught me to

accept that there are limits to Western science. That other cultures and frame of reference are *not* failed attempts to become and to think like us, but that there simply are numerous models and approaches that can be used to understand the world.’ This multiplicity of perspectives offers a number of starting points for education, she stressed — for example, by using learning methods that prompt students to look at their surroundings with new eyes. She demonstrated some of these during a mini-expedition over the campus. She got the participating teachers to ‘read the landscape’ with their hands: feeling a particular tree with their eyes closed, and checking whether they could find that tree again after a disorienting round of ‘blind man’s buff’. They could.

Another exercise was to ‘map’ the campus by recording natural sounds (with the soundtrack of the artwork *Must Leave* providing pleasantly disruptive interference). And lastly, Baaijens got the teachers to literally change perspectives by strolling across the campus with a little mirror.

Fired up

In spite of some practical drawbacks – many curricula in higher education are already overloaded with compulsory examination material – by the end of the evening, most of the teachers were fired up with enthusiasm to put what they had learned from Baaijens into practice. With their students, and maybe with colleagues too. As a teacher said: ‘There are more worldviews than the ones we always base things on. Actually, everyone needs to become more aware of that.’ ■

Grab the PFAS!

The PFAS filter they developed has let organic chemists from WUR make great strides towards removing the harmful substance from the environment. Text Roelof Kleis

Was it serendipity, the chance discovery of something you are not even looking for, or was it by design, and the product of smart and calculated experimentation? Professor of organic chemistry Han Zuilhof stays neutral. 'Either version would be too black-and-white. You have an idea and experiments produce results you didn't expect. You continue to experiment on the basis of possible explanations. You all have different ideas, and together you construct the narrative.' However it came about, the PFAS filter designed by Zuilhof and his team can rightly be called a triumph. The filter almost totally purifies water that is heavily contaminated with PFAS (see inset) in one simple step – to the extent that the water meets the quality standards for drinking water. What is more, the filter can be reused countless times.

Cholera

It all started with cholera, explains Zuilhof. 'Cholera toxin, the protein complex that causes cholera, has five-fold symmetry and an additional toxic protein besides. The five identical locations let the toxin attach itself to cells. In 2016, we took the first steps towards making something like this ourselves with pillararenes, a class of large ring-shaped macromolecules. Pillararenes consist of five linked molecules with benzene rings and bridges that form a kind of pillar. We developed a chemical process for making those rings active by attaching molecules to them on both sides.'

At that point, PFAS molecules were not in the picture at all. 'That changed when we started thinking about what we wanted to attach to those rings,' explains Zuilhof. 'It's relatively easy to attach a positively charged molecule to them. One characteristic of this class of arene is that the

"tails" with their positive charges at the end all point in the same direction, away from the pillar, along its axis.' (See illustration.) That cloud of positive charges above and under the whole ring pull in negative charges like grippers. Take octanoic acid, the unfluorinated version of one common PFAS. Octanoic acid attached as expected. But things got really exciting, says Zuilhof, when the PhD researcher Tu-Nan Gao turned his attention to PFAS. PFAS proved to attach unexpectedly strongly, as if the grippers had been made for them. 'The attachment is much stronger than with any other substance that can bind fluorinated compounds such as PFAS. At the same time, that attachment is much stronger than with any of the other substances in polluted water. Even if those other substances are present in concentrations a thousand times stronger. Those other substances attach somewhat as well, but then get squeezed out.'

Fluorine

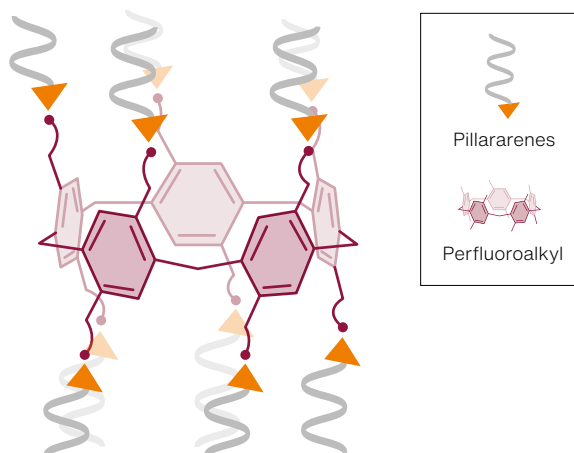
Zuilhof now knows that the reason why the macromolecule binds PFAS so selectively is the presence of fluorine atoms in the carbon chains of the grippers. 'Those fluorinated chains are lying side by side, which maximizes the interactions (known as Van der Waals forces, ed.) between the fluorinated chains. They form a kind of fluorine cloud that reinforces the binding of PFAS.' Fluorine atoms maximize that binding force precisely because they are exactly the right size and positioned just right. And that paves the way for an important application as a PFAS filter.

'A single filtration suffices to reduce the concentration of PFAS in heavily polluted water to one millionth of what it was'

This filter is formed by attaching one end of the pillar-shaped macromolecule to a fixed surface. The other end of the pillar grabs hold of PFAS in polluted water that is passed over the filter. Trials show that a single filtration suffices to reduce the concentration of PFAS in heavily polluted water to one millionth of what it was. That step takes less than five minutes. The filter can then be cleaned by rinsing it with alcohol, and it can be reused countless times.

You are still left with the question of what to do with the PFAS. Zuilhof's team have come up with something for that too, and are working on a way of destroying the substances. But the research is not finished yet. PFAS is a collective term for thousands of compounds. Zuilhof's PFAS filter fishes two important substances (PFOA and PFOS) out of the water. Zuilhof: 'The question is whether we can adapt the filter so that other PFAS compounds are extracted too. We are working hard on that. There are also compounds that contain other halogens instead of fluorine. One example is bromine, which is used in fireproof materials. It might just work with bromine in the chain too.'

Zuilhof is understandably proud of the study, which was published recently. 'My colleague Huub Rijnaarts once said there were two big problems with our water. We've either got too much or too little of it, and we've got PFAS. I can't do anything about the volume of water, but I can do something about the PFAS. That triggered me. With our research, I can make a significant contribution towards addressing pollution with PFAS. That's real science for impact. Great, isn't it?' ■



Pillararenes with a positively charged side group capture negatively charged PFAS molecules from contaminated water. ♦ Illustration Resource

PFAS

PFAS stands for per- and polyfluoroalkyl substances, a group of hydrocarbons containing a lot of fluorine. Well-known examples are PFOA (perfluorooctanoic acid, used in manufacturing Teflon) and PFOS (perfluorooctane sulfonates, used in the textile industry as a water- and stain-resistant preparation). PFAS are toxic for humans and the environment and do not biodegrade easily, if at all.

Patent

Professor Han Zuilhof's group has taken out a patent on the method they developed for filtering PFAS out of solutions. Wetsus, the research institute for sustainable water technology, is going to market the patent. In exchange, one PhD candidate in Zuilhof's group is going to do further research on cleaning up pollution with PFAS.



For decades, the Chemours factory in Dordrecht emitted PFAS into the water and air. ♦ Photo Shutterstock

‘We are heading for room shortages’

Bart van As, director of Wageningen student accommodation provider Idealis, talks about room sharing, students’ changing preferences and a possible shortage soon of hundreds of student rooms.



Text Luuk Zegers

If you cycle along Marijkeweg, you will see a brand-new student complex – M20 – on the site of the old vocational college that used to be there. Idealis director Bart van As is expecting the first occupants to be able to move in this September. More such developments are scheduled to follow M20, including new buildings on Mansholtlaan (250 rooms, planned delivery date 1 September 2026) and Bornsesteeg 2.0 (350 rooms, planned delivery date 1 September 2027). And the Asserpark and Dijkgraaf student flats are due to get a major refurbishment.

But Van As still has concerns. Despite the plans for refurbishments and new buildings, temporary housing solutions such as Haarweg 333 and Nieuwe Kanaal will soon no longer be available because the environmental and planning permits will expire. Van As: ‘We are working on several development projects but given the predicted student numbers, we are still looking at a shortfall of 300 to 600 rooms in five years’ time. That is why we are seeing whether we can extend some of the temporary environmental permits for student accommodation or convert them into permanent permits for housing. It is not yet clear whether that will be possible.’

Idealis aims to offer all first-year students a room by 1 May of their first year at university. Did you succeed this year?

‘On 1 May, there were 62 first-years who were still looking for a room. So we didn’t succeed this year but we got close. With the completion of M20, we expect to achieve that target next year.’

You expect a shortfall of 300 to 600 student rooms in five years’ time. That seems inconsistent with this aim.

‘It will be difficult. That is why we are asking the municipality to give us more space. But the municipal council is increasingly making noises about Wageningen being too “full” for students, and that we need to look at options for student housing in Renkum, Ede or Bennekom. Yet students are not keen on that at all. There is this impression that a lot of accommodation has already been built for students and now it’s the turn of ordinary people. They want more accommodation being built for the regular market.’

Hasn’t the municipality got a point there?

‘It’s not a question of either-or; you need to do both. Anyway, if you focus on new buildings for the regular market, that doesn’t necessarily stop students coming to the town. If we hadn’t built accommodation on Costerweg, perhaps the wealthier parents would have bought 60 regular flats for their children and friends. In other words, not building enough accommodation for students is not good for the regular market either.’

Major new constructions and refurbishment projects are planned for the next few years. How does Idealis decide what to spend money on?

‘Each year, we compile the student accommodation monitor together with the university and the municipality. In it, we analyse the predictions for student num-

bers according to various scenarios. Our collaboration with the university is reflected in the Mansholtlaan and Bornsesteeg 2.0 developments, both complexes that will be built on university land. In addition, all our tenants get a questionnaire every year asking them about their wishes and their assessment of their current accommodation. We use this information as input when determining what to spend our money on. We are a foundation and are therefore not allowed to make a profit, so we invest that money in our priority areas: new construction, refurbishment and maintenance, and keeping rents affordable. There is a national points system that you can use to determine how much rent you can ask for a certain type of accommodation. At Droevendaal, the rent is 90 per cent of what we are allowed to ask, and it is sometimes only 80 per cent at older complexes. This is why Wageningen is still one of the most affordable places to live for students.'

In recent years, room sharing has been used as a temporary emergency solution for international students who were still without a room at the start of the academic year. Couldn't you offer that permanently?

'At Dijkgraaf, about 50 students shared a room. That was a bit improvised because the rooms weren't designed for sharing. Room sharing affects the rest of the flat too, because you end up with more people sharing the kitchen, shower and toilet as well. That is not optimal in terms of the facilities. At the same time, many students from the US, China or Southern Europe for example are

'The municipal council is making more noises about Wageningen being too "full" for students'

used to sharing a room. We see a demand for this solution, in part because it is financially appealing for the tenants. That is why we are investigating whether we could offer some shared rooms for two to four occupants in the complex we will be building on Mansholtlaan. But the rooms and all the other facilities would then be designed to cope with this.'

Are students' accommodation preferences changing in other ways too?

'Definitely. One change is that students no longer want to share a unit with 10 to 18 people, like they do now at Dijkgraaf. That is why we are aiming for units with a maximum of six to seven occupants in our refurbishments and new buildings. When the units get bigger, no one feels the urge to take responsibility. It is also more difficult to "integrate". People feel more of a bond with one another in a unit of six people, and they find it easier to hold one another to account.' ■



The new M20 student complex on Marijkeweg. ♦ Photo Resource

Solving eel puzzles with methylation patterns

WITH A SAMPLE OF FIN TISSUE

Ostensibly simple things like age and sex are difficult to determine in young eels. Wageningen researchers are examining the extent to which methylation patterns – how methyl groups bind to DNA – provide something to go by. And there are more applications on the horizon.

Eels are down as ‘critically endangered’ on the IUCN Red List. Age and sex are important factors for reliably estimating eel stocks, explains Tessa van der Hammen, a researcher at Wageningen Marine Research and a member of the ICES Eel Working Group (WGEEL), which advises the EU on catches. The only problem is that these are tricky factors to pin down, partly because growth patterns can vary greatly depending on where the fish lives. ‘So a particular length is not synonymous with a certain age,’ Van der Hammen explains.

Labels on DNA

The age of an eel is currently estimated by counting the rings on the otoliths, the ear organs found in fish. But this method is expensive, has a relatively big margin of error and involves killing the animals. The planned new method only requires some DNA taken from a small sample of fin tissue. Marine biologist Reindert Nijland: ‘In simple terms, when we analyse methylation patterns, we look at labels on the DNA that determine whether particular genes are expressed or not. At present we have no idea which methylation patterns corre-

late with which age or sex. But if we can get enough data from enough fish, we can start identifying patterns – using big-data machine-learning algorithms that help us spot the correlations. I am confident that we will succeed in matching patterns to age and sex,’ says Nijland.

Complex sex

DNA from at least 100 eels will be taken for this project, to analyse the methylation pattern and determine their age and sex. For the smaller specimens this is no easy task, explains eel reproduction expert Arjan Palstra. ‘In fish of 30 to 35 centimetres long it’s possible to base sex determination on physical features. But with the smaller fish you can’t do that, or only with great difficulty. Then we have to use methods like measuring hormone levels in the blood to see if we can determine the sex – insofar as that can be distinguished, which is uncertain. That happens with fish: the environment – temperature, pH value, photoperiod,



Text Marieke Enter

social situation – can affect the phenotypic sex.’

So sex determination is no easy matter, explains Van der Hammen. ‘Only when the young eels have arrived in western Europe is it clear how they are developing: will they be male or female? It

Measuring methylation

Methylation, the ‘labels’ on DNA, can be measured with a device called a nanopore sequencer, which has been on the market for about five years now. It reads DNA codes at lightning speed by passing single-stranded DNA fragments over a plate with channels - nanopores - that are electrified. The sequence of bases in the DNA can be read because the electrical signal is interrupted when they are in the nanopore. If it contains a methylation group (‘just a C atom with a couple of H atoms,’ says Nijland), you get a different signal than you get if there is no methylation. The software recognizes this automatically. ‘With DNA sequencing, we actually get the information about methylation for free. We just have to apply a different algorithm,’ says Nijland.

depends on the population density: the lower the density, the more females there are. In the Netherlands, the decline of eel stocks is clearly reflected in the sex distribution. You used to find mainly male eels in the IJsselmeer. Now the population there is much smaller and most of the eels are female. The same goes for the Lower Rhine and the North Sea Canal.'

Future research questions

If the methylation method turns out to work well, it will not just offer the advantage of identifying sex and age faster. Researchers also expect to learn a lot about physiology through it. Nijland: 'If we can trace the locations where the DNA was methylated, we'll know which genes play a role as well. And although we are now specifically looking for correlations with sex and age, we will sequence everything: the entire DNA of every individual. That data will remain available for answering future research questions.'

Van der Hammen has one important outstanding wish. 'A very important application would be to determine with methylation patterns whether an eel was released into the wild. Currently a lot of glass eels are released in the Netherlands. Both nationally and internationally, there is quite a debate about whether those released eels can find their way to the Sargasso Sea, and whether they reproduce there as successfully as other eels. We can't monitor that at the moment: once released, it's impossible to distinguish a released eel from the rest.'

There are quite a few gaps in our knowledge about eels, says Palstra, particularly concerning what happens in the ocean in relation to reproduction. 'It was always extraordinarily difficult to develop good research methods for that. These modern techniques seem to herald the dawning of a whole new era of research.'



At the Maretarium in Kotka in Finland there is a group of eels known to be 48 years old. Arjen Poelstra snipped a bit of fin tissue from one of the eels to use the DNA as reference material for age determination. ♦ Photo Pauline Jehannet

The project is a collaboration between Wageningen Marine Research and two chair groups: Marine Animal Ecology, and Breeding & Genomics. There are overlaps with both the Centre for Fisheries Research's statutory research tasks and

the Next Level Animal Sciences innovation programme. The work of the next few months will mainly revolve around data collection, and the analysis will follow in 2025. 'But no doubt we will already do some combing through the data this year. We are extremely curious,' concludes Nijland. ■

'The planned new method only requires a sample of fin tissue to collect DNA'

Bringing science to life with illustrations

Sanne Raghoobar, assistant professor of Consumption & Healthy Lifestyles, wants to make science more visual. One of her illustrations appeared recently in *Appetite*, a peer-reviewed scientific journal. Text Dominique Vrouwenvelder

When Sanne Raghoobar got her PhD three years ago in the chair group she now works in, she designed her thesis cover herself. 'A colleague of mine like it so much that she encouraged me to set up an Instagram account for my illustrations and to share the fact that I do this more often on LinkedIn. That was the start of my own company Dr. ArtSci,' explains Raghoobar from her chair group's common room. 'Since then I have increasingly drawn on my passion for illustration in my work as a scientist. I want to make science accessible through illustrations.'

In the illustrated paper published by the peer-reviewed journal, she and her colleagues documented what it takes to get

adolescents at secondary schools to make healthier and more sustainable dietary choices. 'We organized focus groups for that, with experts in the fields of health, sustainability, education and nutrition. The experts told us that adolescents don't form a homogeneous target group. We want to communicate that knowledge to the readers. With this illustration (see illustration, ed.) it is clear at a glance – much faster than in text – that the target group is highly diverse.'

Creative

'Science is a creative endeavour and we scientists can harness our creativity to make our research more accessible. Images can help to strengthen research

methods, make research projects visible and identifiable, and communicate research results in an appealing and comprehensible way.'

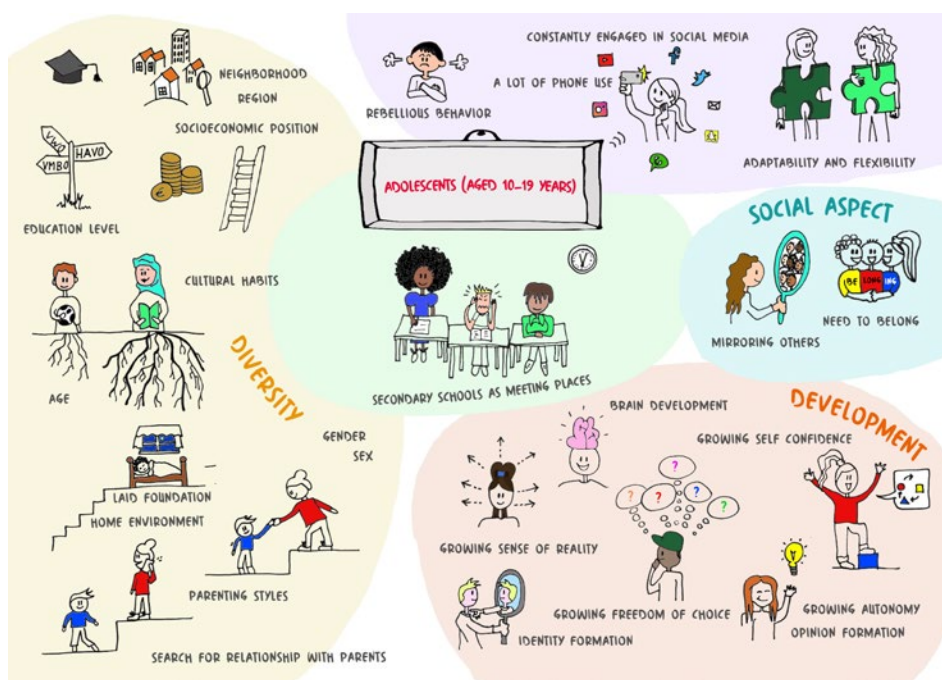
'We know that people understand and remember information better if it is offered both textually and visually. That makes absorbing the information more enjoyable as well. And it is generally easier for people from the lower socio-economic echelons to understand information supported by visuals.'

'People understand and remember information better if it is offered both textually and visually'

'Ultimately, as a researcher you want to make an impact, scientifically and socially. By combining tools like questionnaires with illustrations, you can cater for differences between people and you make your research more accessible. Moreover, scientific articles can be hard to follow for practitioners in the field. With creativity – illustrations, film clips, acting, presentations or photography, whatever suits you best – we can try to reach more people and make scientific findings easier to apply.'

Influencers

'I think we can learn a lot from online influencers. Not everything they say is correct, but the general public enjoys their posts. The way they share their information works: they have a broad following and can therefore have a big influence. Scientists could do that too, but need to tackle it more creatively at times.'



A visualization of the characteristics of adolescents. An illustration by Sanne Raghoobar (© Dr. ArtSci 2023) that appeared in *Appetite*.

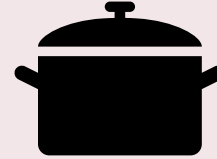


You see great-looking people and the coolest outfits on the Wageningen campus. In this feature, we put one of them in the spotlight. This time it's Jay Struts, a Bachelor's student of Environmental Sciences from America. Text and photo Linde Klop



'My sense of style swings like a pendulum between the eclectic and the ethereal. My wardrobe contains a spectrum that ranges from techno-vampire chic to hardcore woodland-fairy, both drawing inspiration from the fantasy worlds of TV shows. In high school, my style was hampered by a lack of self-confidence. I did not yet dare to dress boldly. This changed due to the combination of Covid and uni. I became more comfortable with myself and my gender identity, and I started embracing the fluidity and artistry of fashion. Previously, I shied away from traditionally feminine attire, but as I became more male-presenting, I started wielding gender as a creative tool, transcending conventional boundaries. Both because my preferred aesthetic isn't commonly found in fast fashion stores and because it does not align with my own sustainable beliefs, I rarely buy new clothing. Instead, I curate my own wardrobe by combining thrifting, scavenging, and reworking items to match my evolving taste. I tear my clothes apart and sew them back together Frankenstein-style. When I was very little, my mother sewed me costumes. Later she taught me the skill so I could make whatever I wished. Currently, the piece I am most proud of is a blouse that I made that is reminiscent of the cover of a pirate fantasy novel. For me, fashion is a playground, and my sewing machine is the jump rope.'

You encounter all the flavours of the world in our WUR community. Dominique Vrouwenvelder (29), *Resource* science editor and amateur cyclist, shares a recipe for lemon risotto that is bound to be a hit with everyone.



Flavours of WUR

Lemon risotto

'I first made this risotto last Christmas. It's the perfect comfort food and the colours are a bit Christmas-massy too. But this dish is tasty any time of year. The tangy freshness of the citrus fruits makes it equally suitable as a summer dish. I like to cook it when people come round for a meal and it is always a success. This risotto also makes a good choice if you want to do some serious cycling the next day or have other plans for an active day.'

Ingredients for two people :

- 1 lemon
- 1 lime
- 700ml vegetable stock
- 80ml dry white wine
- 1 shallot
- 140g risotto rice
- 60g cream cheese
- olive oil
- 200g cherry tomatoes
- 2 (vegetarian) schnitzels

Preparation time :

⌚ approx. 25 minutes

- 1 Grate the peel of about one quarter of the lemon and lime. Squeeze out about a quarter of the juice from each fruit.
- 2 Add olive oil, salt and pepper to the cherry tomatoes and bake them for 20 minutes in an oven preheated to 170 degrees.
- 3 Chop the shallot fine and fry it in some olive oil over a high flame. Turn the heat down, add the risotto rice and fry it briefly, then add the white wine and lemon and lime juice.
- 4 When nearly all the liquid has been absorbed, add a little stock. Keep stirring and once the liquid has almost been absorbed, add some more stock. Repeat until the rice grains are soft — about 15 to 20 minutes. You may have some stock left over.
- 5 Mix the cream cheese and lemon and lime zest in with the risotto.
- 6 Fry the schnitzels.
- 7 Serve the risotto with the schnitzels and tomatoes.



Dominique Vrouwenvelder

Limelight

Not much culture in Wageningen? In this regular feature, we show how wrong that is. This time, read about the anniversary concerts of Wageningen student choir and orchestra WSKOV.

Text Ilja Bouwknegt

Student orchestra and choir celebrate with 'nature music'

Mees Ike (23), Geo-information Science Master's student, and Jasper Wetzels (22, Plant Sciences Master's student, are both members of the Wageningen student choir and orchestra WSKOV. Mees is a tenor and Jasper plays the viola.

What Mees and Jasper like most about performances is that group vibe. 'At the start, you have to learn a lot of notes but later you can let go of that,' says Mees. 'Then you create a distinctive sound and it becomes something really cool,' Jasper agrees as a viola player. 'I am

not the most important musician, but it would sound a lot starker without the violas. Your role is that one note in the orchestra's whole range.' WSKOV is celebrating its 105th anniversary this year. To mark that, professional musicians will be joining in some of the pieces. The theme of the concert is 'Echoes of Nature'. 'We are playing music with a nature theme, such as a traditional Swedish song with the line "How good the begonias look and the wild mint"', says Mees. The choir will be singing three pieces by Ravel. 'They were written during the First World War,' says Mees. 'You can feel the anger and grief in the music — it's really beautiful.'

The orchestra will be playing Tchaikovsky's fourth symphony. 'This is the hardest piece we've done in the past ten years,' says Jasper. 'Some parts are very fast and the brass section needs real power. It takes a while before you dare to play this.'

The choir and orchestra also play one work together; it was composed specifically for this concert by former WSKOV conductor Cees Mobach. 'That work is pretty special,' laughs Jasper. 'It's WSKOV's birthday so the piece consists of variations on the Dutch Happy Birthday tune just for us.'



FRI 7-6-2024

Junushoff Theater

20:00

SAT 8-6-2024

Stevenskerk Nijmegen

20:00

€10 for students,
€20 for non-students



Meanwhile in... India - Elections

WUR is incredibly diverse, with hundreds of internationals working and studying here. In the *Meanwhile* in column, we ask one of them to comment on certain events in their home country. This time, we hear from Communication, Health and Life Sciences MSc student **Ananya Doraswamy** (32) from Bangalore, India, with her insights on India's elections. Text Youssef el Khattabi

Doraswamy: 'I should preface this by saying that India is huge — the most populous democracy in the world — with a very complex social structure. Every community has its own dynamics so it's hard to generalize about anything. Also, with over a billion people, this election is an incredible administrative feat.

I consider this election year crucial as under the current government, which has been in power for two terms now, we're seeing the pillars of democracy being gradually undermined. As a communications student, it's the freedom of the press that worries me the most. We dropped 21 places in the Reporters Without Borders' World Press Freedom Index in 2023. The PM hasn't called a press conference with the Indian media since 2014. The fact that I'm apprehensive about voicing an opinion on the political state of things is worrying.

The strong religious tone in the campaigning also stands out to me. India has always been a secular nation. All religions are equal

by law and let's hope the divisive campaigning doesn't translate into policy changes. The right-wing party BJP and the centre-left INC are key in India's multiparty system. Both engage in 'vote-bank' politics, where a loyal bloc of voters from a single community consistently back a certain candidate or party.

I try and stay informed by following independent Indian journalists online and also *The Guardian*. I think international reporting on Indian politics often lacks nuances.

As a student of social sciences here, I'm encouraged to think critically about events. The insidiousness of colonialism, and its drain on resources and people has become clearer to me. India was colonized for nearly a century and despite that, we've come so far. I hope we continue to progress rather than lose ourselves in religious conflicts. Most people just want a peaceful life, and I hope that vision prevails.'

General elections were held in India from 19 April to 1 June 2024



[column]

A SENSE OF HOME

A single ray of bright sunlight finally snuck into my room here in Wageningen. The yellow beam traced a path across my colourful rug and tapered off at the suitcase I was using to pack away all my winter clothes. Sitting in the warm sunshine, I could close my eyes and almost imagine myself back home in South India.

It was not so long ago that I had a similar moment with the same suitcase laying open before me. It was late August, I had just received my Dutch visa and needed to fly out from Bangalore to Amsterdam the next day. So, I couldn't put off packing any longer.

My resolve to do a Master's abroad prompted me to make many big decisions about my life. It also prompted a hundred smaller decisions – like what to carry across the world with me. The airline permitted me to carry 26 kgs of my current life into the new one. What would you choose? Next to the suitcase, I had a small mountain of things given by well-wishers. As I gazed into the empty cavity of the bag, I pondered the implications of leaving some of these behind. Would it mean I loved them less? That somehow it meant I was leaving them behind as I moved on?

On that day, the sky was a clear, brilliant blue and the leaves of the jamun tree outside rustled every now and then as the birds wove their way through, feasting on the juicy, purple fruit. My dog Thor lay snoring close-by. My nephew's gleeful laughter rang through the air. The things that made home, home. I imagined grabbing all of it – the sunshine, the sounds, the snoring dog, the delicious slowness and comfort of the afternoon – stuffing them into my bag and zipping it shut. It would never make it through customs.

Boisterous laughter from the next room broke through my daydream. It took me a minute to refocus to the present. Smells of dinner being made, soft music playing in the background and my housemates calling me to the table. A new home. More things that will not fit in my suitcase when I fly back.



Ananya Doraswamy

Ananya Doraswamy is a Master's student Communication, Health and Life Sciences from India. She delights in a slow-paced day that has plenty of time for cloud watching and tree-gazing. She enjoys being in busy, multicultural kitchens that have plenty of food and stories to offer.

WEEKLY UPDATES ON STUDENT LIFE AND WORKING AT WUR?

Go to resource-online.nl (Subscription page) and subscribe to our digital newsletter.

SIGN UP



Resource

Colophon

Resource is the independent medium for students and staff at Wageningen University & Research. *Resource* reports and interprets the news and gives the context. New articles are posted daily on resource-online.nl. The magazine is published every fortnight on Thursday.

Contact Questions and comments for the editors: resource@wur.nl | www.resource-online.nl

Editorial staff Willem Andrée (editor-in-chief), Helene Seevinck (managing editor), Roelof Kleis (editor), Luuk Zegers (editor), Marieke Enter (editor), Coretta Jongeling (online coordinator), Dominique Vrouwenfelder (editor).

Translations Clare McGregor, Meira van der Spa, Clare Wilkinson

Design Alfred Heikamp, Larissa Mulder

Overall design Marinka Reuten

Cover illustration Valerie Geelen

Printing Tuijtel, Werkendam

Subscription A subscription to the magazine for one academic year costs 59 euros (135 euros if abroad). Cancellations before 1 August.

ISSN 1874-3625

Publisher Corporate Communications & Marketing, Wageningen University & Research





Photo Shutterstock



NEW PARTY WINS STUDENT COUNCIL ELECTION WITH BEER AND PIZZA

P&B, the new party founded in January, managed to win all 12 seats in its debut in the Student Council election. It also persuaded a record number of students to cast a vote: 97 per cent instead of the usual 35 per cent or so.

Pieter Pintemans, who leads the brand-new party, is delighted with the success of P&B. 'This shows we struck a chord with the students in a way other parties don't manage. Normally, two thirds of students are too lazy to cast a vote. Our manifesto shows that if you present students with something worth choosing, they are prepared to click on that link and vote. You just have to fire them up with great plans.'

Pintemans is happy to go through those great plans one more time for us. 'The established Student Council parties basically all want the same: better education, more sustainability, and so on. The same old story. We say: education and sustainability are doing fine. What students really need in these times of inflation, rising college fees and threats of fines if you don't finish your degree on time is a bit of encouragement. Preferably free. That is why our P&B manifesto is focused on one thing and one thing only: free pizza and beer for all students.'

Sure, that might sound a bit populist, as Pintemans admits. 'I get that people think it's a joke, but it will solve a whole bunch of problems. Students are struggling with climate depression, loneliness, financial worries, FOMO and much else besides. If you can get together to talk about your fears and worries over a pint and slice of pizza, everything will soon look a lot better. You will no longer be lonely because you'll be chatting and boozing with your fellow students. And your money problems won't be quite so bad because it's free.'

Dean of Education Anton Bergt is pleased with the record turnout for the election. 'This is a unique achievement. No other Dutch university gets close. Political engagement is alive and kicking in Wageningen.' He does have doubts though about P&B's rather short manifesto, which literally fits on the back of a beer mat. 'As Dean of Education, I would have hoped for a bit more on education, I guess. The manifesto doesn't even mention it once.'