

Foundation GBE-FMF
Nèsos '15
Nijenborgh 4
9747 AG Groningen
The Netherlands

Final Report Nèsos '15

Scientific Excursion to

Singapore and Indonesia

Final Report

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GBE Nèsos 2015



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Scientific Excursion to
Singapore and Indonesia



This is a publication of the Nèsos '15 committee under the Foundation Grote Buitenlandse Excursie(s) - Fysisch- Mathematische Faculteitsvereniging (Foundation GBE-FMF), best to be translated as Foundation for International Student Excursions. The foundation was established by the Fysisch-Mathematische Faculteitsvereniging (FMF), the organisation for students in Astronomy, Computing Science, (Applied) Mathematics and (Applied) Physics of the University of Groningen.

The goal of the Foundation GBE-FMF is to organise (inter)continental study tours for students of the FMF every year. The foundation consists of a board and a committee. The board acts as a supervisor while the committee is involved in the actual organisation.

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Preface

Written by: Maarten Degen

I am very happy to present you with the final report of the scientific excursion made from the 11th of April 2015 until the 2nd of May with a group of 26 enthusiastic students, including the committee Nèsos '15, and two staff members from the University of Groningen. We visited Singapore and Indonesia and became acquainted with the science, culture and customs of both countries.

Looking back on the excursion, I instantly think of all the good memories we made with the group. For instance, the arrival at Bandung airport, here we were all surprised by the complete chaos of Indonesia. It was the complete opposite of the well-organized Singapore and without noticing we had got used to the obsessive regulations of Singapore. These regulations forced us to get in line properly before entering the subway, we were absolutely not allowed to drink beverages in the subway and also chewing gum anywhere was absolutely forbidden.

On the other hand in Indonesia our bus did not arrive on time (off course), the walk to the terminal was on the landing strip itself and the streets were so crowded we could not imagine ever making it to the hotel with such a large bus.

However, finally it all worked out and actually it was fun to experience such a culture shock in Indonesia. This is also how I experienced the

journey, as one with a lot of opposites. I hope in this final report we are able to provide you with a good insight of the beautiful journey we made.

The organization of the trip took some serious efforts from the committee. Therefore I am also proud to present the people who worked so hard to make this happen: Steven van der Veeke as our Treasurer, Jos Borger and Fanna Lautenbach as our Business Commissioners, Lianne van Timmeren as our Programme Commissioner and myself, Maarten Degen, as Chairman of this wild bunch.

To make it all happen, we were assisted by staff members, Herbert Löhner and Olaf Scholten, Programme Manager of Southeast Asia of the University of Groningen Tim Zwaagstra and the foundation GBE-FMF. Thanks to all for the outstanding help for preparing this trip!



Funding for the excursion came from institutions and sponsors, but also the participants' own financial contributions and in the form of case studies (a small research assignment for a company or institution). In this booklet you will find short reports of these projects written by the participants themselves. Accounts of our daily cultural and scientific activities are written to guide you day by day through our great journey.



Also, views and impressions from the foundation GBE-FMF, the two staff members and the organizing committee are included.

Finally, I hope you will enjoy reading about this journey.

Maarten Degen
Chairman Nèsos '15





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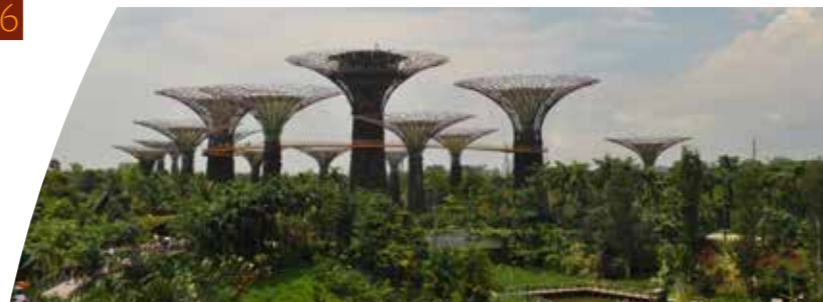
Preface 006

Participants 010

Day Reports 016

- Day 1: Klaas Hakvoort
- Day 2: Maike Jaspers
- Day 3: Olaf Scholten
- Day 4: Herbert Löhner
- Day 5: Maxens van Daalen
- Day 6: Tobias Mulder
- Day 7: Isabelle Tan
- Day 8: Ronnie Tamming and Joost Calon
- Day 9: Randy Wind
- Day 10: Natascha Koelewijn
- Day 11: Sanne Jonker
- Day 12: Douwe Visser
- Day 13: Nils Wiersema
- Day 14: Casper Dijkstra
- Day 15: Rosa Kappert
- Day 16: Lianne Jansen
- Day 17: Arjen Zijlstra
- Day 18: Jim Baarslag
- Day 19: Thiadrik Tiesma and Jaap Eising
- Day 20: Lianne van Timmeren
- Day 21: Lianne Jansen
- Day 22: Fanna Lautenbach
- Day 23: Tobias Mulder
- Day 24: Klaas Hakvoort

Organizing Committee 083



095 Staff Members

099 Foundation GBE-FMF

100 Financial Report

105 Case Reports

- Allseas Engineering
- Energy Integrated
- University of Groningen
- Van Wijnen
- Incas3
- Schut
- CIT
- Fugro
- Noordhoff
- Landustrie
- Molgenis
- StudioVO
- NAM
- UMCG
- SKF

132 Acknowledgements

134 Subsidiaries

136 Contact





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Randy Wind
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 Participants



	Morning	Afternoon	Evening
Day 1	Departure: Fly To Singapore		
Day 2			Dinner & Boat tour
Day 3	National University Of Singapore		Alumni meeting Singapore
Day 4	A*star	ABN AMRO	Night Safari
Day 5	Nanyang Technolical University		Free programme
Day 6	Buddha Tooth Relic Temple	Sentosa Island	Sentosa Island (Wings of time, lasershow)
Day 7	Renewable Energy Corporation	UL Transaction & Synpulse (IT consultant)	Free programme
Day 8	Visit Raffles hotel	Gardens by the bay, cloud forest dome & Museum	View from Marina bay & group dinner
Day 9	Fly from Singapore to Bandung		Free programme
Day 10	Institut Teknologi Bandung	Bosscha Observatory	Group dinner at "the Valley"
Day 11	PT Dirgantara Indonesia	Vulcane Tangkuban Perahu	Saung Udjo (Authentic indonesian Play)
Day 12	Crater Lake Kawah Putih		Free programme
Day 13	Free programme	PT Pindad	Free programme
Day 14	Travel to Bogor	Gardens of Bogor	Gardens of Bogor
Day 15	"Taman Nasional Gunung Halimun Salak" Rainforrest tour		
Day 16			
Day 17			
Day 18	Travel to Jakarta	Universitas Indonesia	Free programme
Day 19	Starmas		Free programme
Day 20	DNV GL	Pam Jaya	Alumni meeting Jakarta
Day 21	Thousand Islands		Free programme
Day 22	Visit harbour, mosque an cathedral in Jakarta + city tour		Goodbye Dinner
Day 23	Free programme	Fly to Singapore	Fly to Amsterdam
Day 24	Train home		

Legend

Culture/fun

Scientific

Travel

Day reports



Travel day DAY 1

Written by: Klaas Hakvoort

“Beep, beep” goes the alarm. 3.00 AM is not a fun time to wake. Why would one wish to wake up that early in the morning? I don’t think anyone has found an answer to that question yet, and I doubt one will be found. Indeed, I woke up not because waking up at ‘fuck early in the morning’ was a fun thing to do, but because it was a necessary evil in order to be ready for my taxi to the station, which would arrive at about 4.00 AM, give or take some 15 min.

The station, then, was the gathering place for the depart of the GBE 2015, Nèsos. Since not showing up for departure would be a massive waste of time (spent during the case-study) and money (‘cause there still was a need for a participants fee), and of course the trip was supposed to be awesome. (At this point in time, I did of course not know yet if the trip would be as great as predicted. I will see you again later on in this booklet, and I’ll tell you if it was indeed awesome by then. Or perhaps the many pieces you’ll have read in between has made you form an opinion of your own already.)

After having breakfast, and doing a final check to ensure I had everything with me, the taxi arrived. Well, the taxi was actually a limousine. After boarding this luxury vehicle, a short drive began through the city centre, where we saw many people for whom the Saturday had not yet begun, instead, the Friday night was almost ending. Unfortunately, the limousine was a bit



early at the gathering place, so no one could see me arrive in style.

At 5.00, roughly half an hour after we were supposed to depart, everyone had arrived and passports had been checked. Thus, we drove towards Schiphol as the sun was slowly starting to rise and traffic began to pick up. After we arrived, we checked in our luggage, passed by the passport check, and entered the tax-free zone. Some spent this time shopping (for liquor), but many others (including myself) went for ‘lunch’, or second breakfast, as it was only about 8.50 AM.

Around 10.30 AM, the gate was opened and we departed the cold and cloudy Netherlands to head for the hot, humid and sunny Singapore. Onboard the airplane, there was time for lunch before heading off to sleep, as we would arrive around 5.00 AM local time in Singapore. The flight itself was plagued with many bouts of tur-



bulence, forcing everyone to stay in their seats. This left yours truly with a dry mouth, due to the air conditioning and a lack of water provided by the stewards, and some with a full bladder. These discomforts aside, the flight was without trouble and we landed safely in Singapore.

As at this point, it was Sunday both in Singapore, and in the Netherlands, I’ll hand you off to Maïke to describe our first day in Singapore.



SINGAPORE DAY 2

Written by: Maike Jaspers

After arriving at the airport, where we had to wait some time before we can buy metro tickets at the desk, the moment is there: we set our first step in Singapore! Our first impression after leaving the metro: it is hot and humid... We arrive in Chinatown with the metro and dump our luggage in the hostel. We're not allowed into the rooms yet, so the group splits: a part starts looking for beer and the others want to refresh themselves and walk around later.

As a member of the second group I take a short shower and we depart. First we walk through Chinatown, where we see lots of skyscrapers, very clean streets, lots of cameras and signs with warnings. We walk to the back side of Marina bay, which gives a great view over the entire bay. Because of the heat and sore feet we take shelter for a while under a fake tree; with solar panels and air-conditioning! Then we travel to the Botanic Gardens of Singapore by metro.

The vegetation is clearly different from the Netherlands, but it seems to be a city park where people chill and sit on the grass (apparently that is allowed). Suddenly the sky turns black and it starts thundering. We start to walk back to the metro immediately, but it's already raining cats and dogs. We seek shelter under a small roof and speak with some people from Sri Lanka.



They tell us that this downpour can be going on for the next two hours! Unfortunately we don't have that much time, we have to meet at the hostel again, so we have to go through the rain. Within two minutes we are sodden, so on the first day we have already experienced several typically Singapore conditions. After arriving at the hostel we quickly change clothes and go on our way to the Crab restaurant where we will learn some more about Singaporese culture. Eating crab is, as I hear, for most very messy and not really delicious.

After dinner we go on a boat trip along the most beautiful lanes and buildings of Singapore and we get to see a laser show. Despite the fact that the boat trip is very impressive, almost nobody manages to stay awake the whole time. We were all very tired, due to the jetlag and bad sleeping (in the plane). But it was a very impressive day!



SINGAPORE DAY 3

Written by: Olaf Scholten

Program: National University Singapore & RuG alumni group in Singapore

The day started early, at 6 AM we had to wake-up to have breakfast at a restaurant close to the hotel that opened especially for us. Off we went for the Metro to the National University of Singapore (NUS). After some asking around we arrived and were received well by our host, Prof. Thomas Osipowicz who gave us an interesting presentation.

The physics department is roughly of comparable size as the one in Groningen, perhaps a bit smaller, with approximately 70 first year students. The classes are also very similar, however there is no bachelor project as part of the 3 year Bachelor program. Instead they have a 4th honors year where students join a group to engage in research. The big difference is that the program at NUS is very competitive and that students spend at least 60 hours per week on their studies.

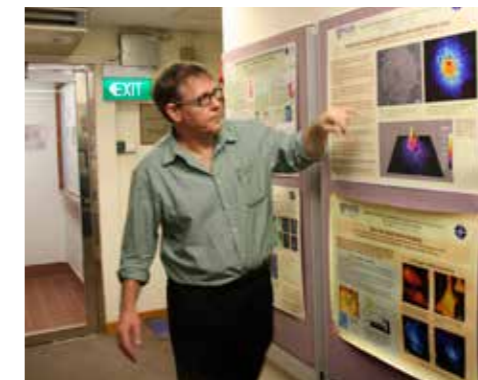
After the introduction we were shown a few labs. In the Ion Beam group they make nano-scale mechanical structures and study the effect of radiation at the cellular scale as is relevant for particle treatment of cancer. In the Astronomy group interesting work on the Hanbury-Twiss effect is done with very little means. The new graphene lab showed that if the government sets a priority it is serious and an impressively large laboratory doing fore-front research



is equipped. It shows that for research where there are possibilities for industrial applications there are ample funds available, for pure fundamental work much less.

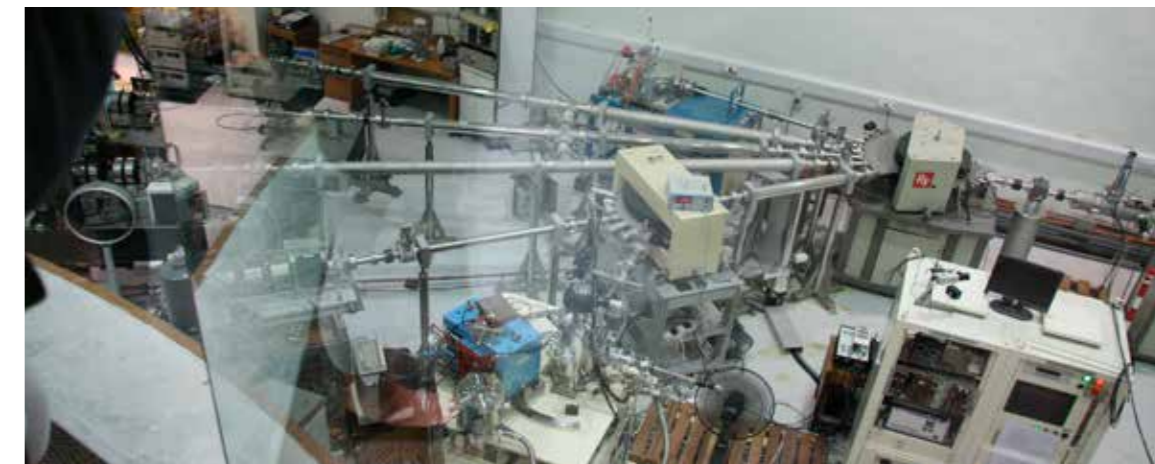
After lunch we got a tour of the new residential part of the campus where we were guided by two students. We were all quite impressed by the excellent looking buildings and the facilities for the 4000 students that live there. Surprisingly the rent for the rooms is comparable to Groningen standards. We also learned that 60h study per week is very manageable.

By bus and metro we went back to the hostel to prepare for a meeting with the RuG alumni group at the Singapore Cricket Club. This turned out to be one of the most exclusive places in Singapore where the lawn (see picture, the SCC is the red building in the center) is worth over a billion euros.



The meeting was, in spite of the exclusivity of the place, very informal and pleasant. Most of the RuG alumni we met were now captains of industry and finance in Singapore. One of them was even a former chairman of the FMF. Their stories offered a very good insight in the Singapore way of life which we would otherwise never have learned. Some of the gaps in our program could be filled on the spot with visits to the ABN AMRO main office and a visit to a consultancy firm. Our visit is also mentioned on the RuG website.

It was a busy and well spent day.



SINGAPORE DAY 4

Written by: Herbert Löhner

A good breakfast at The Loft with pancakes, syrup and Hainan coffee helps us to slowly get adjusted to the warm-wet climate at 1 degree north of the equator. The metro MRTS is busy but not overcrowded so that we reach our destination relaxed and well in time: Fusionopolis, a futuristic high-rise building with tropical garden on the roof and metro station in the basement houses various research organizations, high-tech companies, government agencies, retail outlets, and research institutes of the Science and Engineering Research Council (SERC), among which the Institute of High Performance Computing (IHPC) as part of the Agency for Science, Technology and Research (A*Star).

We have an appointment at 10 am with dr. Evert Klaseboer and dr. Rogerio Manica, who welcome us to Singapore, the “city in the garden”, with interesting news: Groningen is well known in Singapore thanks to Fandi Ahmad, the “pearl of Malaysia”, who once played soccer for FC Groningen. Singapore is the most expansive city in the world; the government strongly emphasizes applied research and prefers giving support to local industries. Talent election starts at primary school enabling the best education and a splendid career for smart kids.

A*Star, the equivalent of the Dutch TNO, acts as an umbrella for sixteen research institutes and offers cooperation with university institutes and industry on research projects and training, in particular in the fields of life sciences and biomedical applications. Research for military purposes is not uncommon. The IHPC employs 200 researchers from 50 countries. Klaseboer presents an example of mathematical tools ap-

plied to simulate fluid dynamics problems, e.g. sound waves and bouncing of bubbles in water.

Thereafter, we visit an interactive exhibition presenting some inspiring examples of e.g. real-time multilingual speech translation, voice (password) unlocking, moving objects through brain waves by concentration, stress detectors, vital-function sensors in a hospital bed, or punch absorber making use of organic material (e.g. maizena). The interesting morning ends with a visit to the rooftop garden overlooking the breathtaking skyline and the crowded Singapore harbour. For lunch we enjoy the food court, typical for Singapore, on the lower floor, featuring about 20 international food outlets.

In the afternoon we are invited by Hans-Peter Borgh, chief commercial officer Private Banking Asia&ME, to ABN Amro on the 25th floor at One Raffles Quay. The harbour below us appears even more busy and so it must have been



already in 1858, when ABN Amro founded the first and oldest still existing bank on Singapore island, supporting the trade with Indonesia.

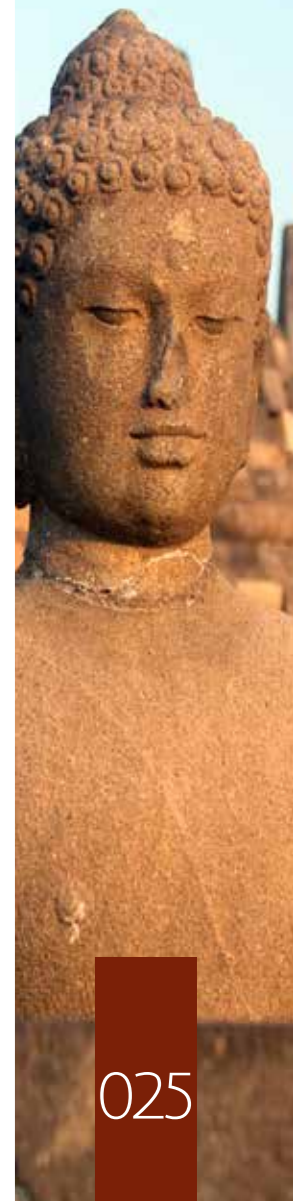
Nowadays the bank supports its business customers with e.g. wealth management products, housing loans, and insurances for e.g. real estate or loaded oil tankers with values around 100M\$. While it is not obvious to some banking personnel why science students would be interested in banking business, we conclude that certain analytical and problem-solving skills are required in banking as well. Laurentien Oiman, Groningen alumnus and master business administration, informs us about her career that started in Amstelveen and led her to Singapore recently.

After dinner at an even larger food court in the financial district, the bus takes us to Night Safari: the world’s first safari park for nocturnal animals. In natural tropical climate one can enjoy



the unique experience of seeing over 2,500 animals in their naturalistic night-time habitats featuring 7 geographical zones, both by walking along dark trails or taking a guided tram ride. Interestingly, some rare lights appear as natural moonlight, which makes the animals less shy. It’s a great experience to come at arm’s length close to leopards, hyenas, bats and butterflies, buffalos, anteaters, wolves and pelicans.

There is only one negative aspect: everybody struggles with taking pictures without flash, leaving only one solution: buy the field-guide to Night Safari!



SINGAPORE DAY 5

Written by: Maxens van Daalen

The day began at the usual breakfast place, where this time we got an English breakfast, which was quite good. After that we proceeded to take a very long journey by subway followed by a bus ride. When we finally arrived at Nanyang Technological University we first visited their Institute for Media Innovation.

This institute is all about interactive new media, which they have incorporated in the “Being There” Centre. Here they work on things such as virtual meetings and social robots. There was one social robot in the centre, which was called Nadine.

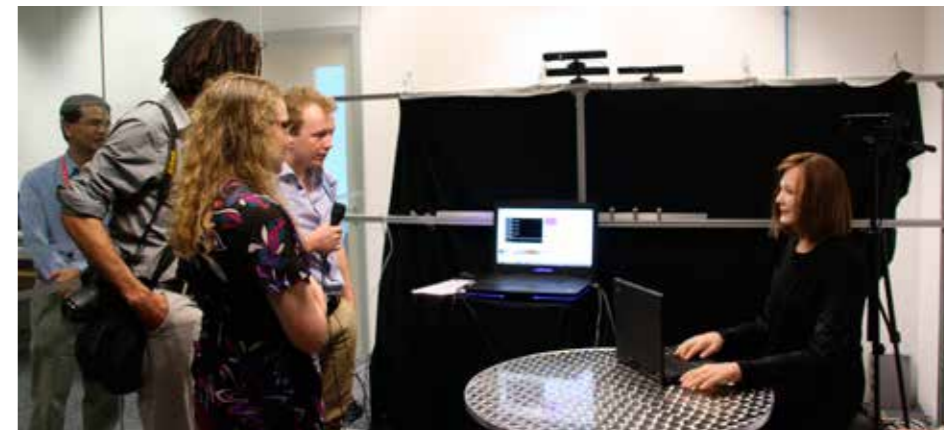
You can talk to Nadine and if you’re lucky she may understand what you say and even answer. Nevertheless, this was quite impressive, until we found out they had imported Nadine from Japan.

There was all kind of other cool stuff, like swimming with virtual dolphins, in case you want to swim with dolphins but don’t know how to swim and there was a 3D game room where we played volleybal, but also this wasn’t working that great. After this interesting institute we got tours to some of the labs.



The engineering department had some nice facilities, for example the photonics lab, where they also do things on plasmonics and use super oscillating lenses and I can see why NTU does well in the rankings.

Lunch was also at NTU, which I don’t remember that well, but I guess there was something with rice. Finally, we got a tour around the campus and this was the end of the program.



SINGAPORE DAY 6

Written by: Tobias Mulder

It is to me the utmost pleasure to either shed some light on of what the 16th of April was like, or to help you relive this beautiful day which we spent in Singapore. As usual, we started the day by having breakfast very early in the morning (Singaporean time) at the spot we are accustomed to by now. The owners of the business once again put up something new for all of us: puffed potato with cheese, two versions of scrambled egg and some, as Prof. Scholten worded beautifully, 'stuff'.

Full of hope and caffeine we went on to visit a Buddhist Temple, located in China Town. The temple is called the 'Tooth Relic Buddha Temple' and was originally built to house a tooth relic of the historical Buddha.

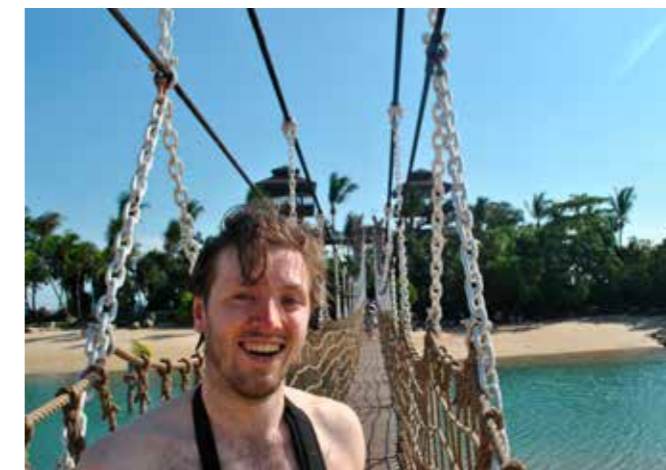
The temple has a very nice, Asian style of architecture with red, green and white being the predominant colours used for the exterior of the building. When entering the temple, one finds him- or herself in a church-like very large hall, covered in red and gold. While we were there, there was a sort of ceremony or worship going on, the hall filled with Buddhist monks and nuns who kneeled regularly. The temple had multiple floors, most of which contained Buddhist art in the form of mostly carvings, which covered entire walls. There was an interesting exposition which explained the life of Buddha. The temple also contained a garden with a small building which seemed to be a place of devotion.



After visiting the temple, we went on to Sentosa Island, often referred to as 'Island of Fun'. I have no doubt most of the participants would agree with this description. Sentosa Island, although very close to the heart of the metropole that Singapore is, is a beautiful island. It has long, white beaches, a beautiful sea surrounding the island and lovely scenery. Moreover, this island is filled with lots of entertainment. Film studios, tropical pools, zero-gravity flight: you name it, it is there. One minor drawback: you have to pay quite high prices, even for western standards.



On Sentosa Island, we went our separate ways to enjoy our afternoon in small groups, to gather again for the 'Wings of Time' light show which was, despite its childish narrative, amazing. Or, as the organizers would describe it 'Spanning several exotic vistas and across the fabric of time, Wings Of Time is a multi-sensory extravaganza that tells an epic tale of courage, mystery and magic brought to you by an internationally acclaimed team'.



SINGAPORE DAY 7

Written by: Isabelle Tan

On the 17th of April 6:00 AM, we started our day at The Loft Cafe with an odd combination: vegetable pancakes, spaghetti and coffee. The organizing committee conveniently planned our program to start very early such that we could communicate with friends and family back home who were still awake when we were having breakfast.

After breakfast we departed from the beloved airconditioners to start our journey to the industrial area in the most western part of Singapore, close to the Malaysian border. By metro and by bus we could get to a bus stop at about 2.5 km from the company, not very far for Dutch walking standards, so we walked. One minute in the Singaporean heat later, we already regretted this decision.

We were welcomed at the company by a delegation of the HR department who were very amused, in the sense that they laughed at us quite loudly, to find out that we arrived on foot. They told us that we were the first visitors to do so in the 6,5 year that this establishment of the company has existed. We were at Renewable Energy Corporation (REC), which is a Norwegian company that provides solar energy solutions, among which high quality (~19% efficiency) solar panels.



After two introductory presentations we geared up with goggles and helmets to go on a tour through the production plant. The many robot arms and the hypnotizing rhythm of the panels making their way through the production line fascinated many. Needless to say, after our visit we were all very relieved when we found seven taxis waiting outside of the building.

The line of taxis drove us back to downtown Singapore to visit two more companies. Impressively, the smooth operators of the committee had arranged the rest of today's program completely after we had arrived in Singapore.

First we visited Underwriters Laboratories (UL) - transactions and security, a branch of UL that provides advice, tests and certification services to companies that operate in the world of electronic transactions such as Visa and American Express. During this meeting, which was arranged in a coincidental encounter in the metro



a couple of days ago, several employees took the time to tell us about the company and about their work. One even demonstrated how she attempted to hack the debit card of Herbert.

Finally we visited Synpulse, a management consultancy company specialized in international financial services, located on the 46th floor of one of the prominent buildings in the skyline of Singapore. This visit was arranged by an employee who we met at the alumni meeting earlier this week. We listened to two presentations and had some drinks during which we could socialize with the employees.

Although this day and many of the previous days started early for us, there were still some die-hard participants (not only students) who wanted to go to a rooftop bar on the 61st floor. Because I did not attend this myself, all I can tell you is that there were probably nice views and expensive drinks.



SINGAPORE DAY 8

Written by: Ronnie Tamming & Joost Calon

Once again, it was one of those mornings where we had to wake up early and have our breakfast at The Loft Café.

After waking up a bit, it was time for the excursion to the Raffles Hotel. This is a five star old colonial hotel named after Stamford Raffles, the founder of modern Singapore.

We walked outside of the building to the lunch-room where a delicious almighty appetizing chocolate-banana pastry was served together with tea and coffee. With this piece of joy in our stomach we used the underground snake to get to Marina Bay.

We followed our way to Gardens by the Bay by walking through a Venice-like shopping centre including a Ferrari shop. An escalator took us to a bridge straight through the Marina Bay Sands Hotel. This revealed two large greenhouses which we went for after a quick lunch. One of them had a Dutch climate with tulips, daffodils and Asian people taking pictures of the former two. After taking some selfies with the tulips and Asian people, we moved to the second greenhouse which had a tropical climate. This one was a bit more exciting since it had waterfalls, high footbridges and carnivorous plants.

When we arrived outside there was a surprise. We found out that Ron “Bumblefoot” Thal, who is currently guitarist of Guns ‘n Roses, was giving a street performance! After enjoying some of his performance we continued to the giant mushroom-like metal trees. These trees give light in the night, absorb water and act as air inlet for the two greenhouses.



After wandering through the gardens it was time to do something cultural so we went to the ArtScience museum. There was an exhibit about da Vinci but of course being scientists, most of the time was spent on making C60 balls. Sadly we ran out of kids to steal the parts from, thus it was time to go onto the roof of the Marina Bay Sands Hotel. Here we stayed to enjoy the view and watch the beautiful sunset. Finally it was time for dinner which was done near Marina Bay Sand which made it possible to watch another exiting laser show. Of course a day in Singapore can't end without drinking the famous Singapore Sling in an expensive hotel while being entertained by live jazz music, so this is what we did before going to bed.





Travel day

DAY 9

Written by: Randy Wind

Waking up after a full night of packing and a little party time we had to get ready for breakfast from 7:30, as usual most of the men of the 10 person room were not so much men in the morning as they were at night. Traffic towards and from the showers was as usual. For a moment it seemed like we were doomed to travel in heavy rain, but luckily this stopped beforehand.

So after most of the post packing was done, we were checked on our passports and tickets by Maarten. Now half of the group already went to the breakfast place on time. The chef at the Loft Café had prepared for us a set of heavenly pancakes and one sixth waffle carrying a classy boiled egg, and we pored ourselves an unforgettable coffee to bring the day (or tea for those...).

On Singapore airport the checking and emigration went perfectly smooth, once in the airport all of started roaming around the airport splitting up into small groups, there were those who went for dinner and those who set the goal to spent their last Singaporean dollars.

In the plane we enjoyed a delicious full and rich lunch, for some this was chicken with noodles for others fish and rice. The flight its path was nearly parabolic meaning we had a very short flight.



As we arrived at the small airport of Bandung we encountered a massive culture shock from almost total control and order to a state of somewhat chaotic and unfinished appearance, the docking bay was just like an outside parking place for airplanes as when leaving the plane we walked our way across the airstrip to the International immigration service where we had to fill a form (twice for some).

The committee discovered they did not have enough money to buy us a visa so we got full understanding from the immigration team while Steven was withdrawing about 14 million rupiah which was multiple hands full of paper money, but eventually we legally got our way into Indonesia and our bus arrived surprisingly less late than expected.

The bus ride was without troubles not considering driving style and bus acrobatics. At the hotel we had to make couples for the rooms.



A small group was blessed with a size wine bottle Bintang, because sadly the hotel was not so well prepared to handle Groningen beer drinkers, since in their eyes we look like alcohol abusers. Arjen discovered that it was quite easy to access the hotel's router and he change the user limit which solved our wifi connection problem. Before anything we had to drop by at Steven's money distribution centre (his room) to get pocket money for the next few days

Later on the day we allowed ourselves to be guided by a local hanging around the hotel, as he claimed to know a good place to eat. But Maarten did not believe this guy at all and decided to involve a Dutch speaking local we came across, while Maarten was negotiating and extracting information from these locals our group split-up into two.



One of the groups ended up in a restaurant with what seemed to be traditionally Indonesian dishes and Malaysian cuisine. After a fairly time consuming payment procedure under the consumption of a Bintang they went to a 'family' karaoke 'bar' for another Bintang, eventually they chilled at a randomly nice looking hotel.

Olaf, Herbert and Steven are working hard to correct and finish their presentation for the next day.



Indonesia DAY 10

Written by: Natascha Koelewijn

New hotel, new breakfast experiences: satchels of ‘meth’ for your brown water and spicy rice/noodles/toast with something that oddly resembles spinach. More good news: we had adopted a cute little gecko from one of the bathrooms and had named it “Noodle”.

Our bus driver and his little traffic manager guided our far too large private bus through the chaotic traffic to the Institute Technology Bandung (ITB). To get a sense of what it was like: it was normal to take your whole family on one(!) scooter and every resident could double as a traffic warden whenever there would appear a traffic jam. Upon arrival, we were stalked by schoolgirls who desperately wanted to make

some photographs of the tall, blond Dutchies. Kindly welcomed by a party of students and researchers there followed a hilarious cultural introductory miscommunication which involved our supreme leader of the delegation wanting to shake the hand of one of the Indonesian girl students.

The buildings were quite old and dark and could be compared with our own Nijenborgh 4. Luckily, our building does have toilet bowls with paper rolls and not just a hole in the ground and a questionable showerhead. There were several presentations forth and back about the universities, education, culture and research. On the campus there were lots of associations, one for every hobby/interest you can have in common with others. These ‘clubs’ have their own room to play games, make music, drink coffee and were grouped together in a square that looked like a town square with all the students doing their own thing and relaxing and having fun to-



gether. After that we visited Bosscha observatory. We were allowed to climb the observatory, open the roofs and turn the telescopes. Indonesian people don't go against the wishes of their guests and we may have abused that sometimes during our trip. Thinking back, I do feel sympathy for those people having to deal with us. Also at the observatory giggling Indonesian children followed our group around.

At the end of the day the committee decided that this family of observatory-climbing-monkeys should be fed. Our dinner location with an amazing view: The Valley. Nothing better than to finish a busy day with a humongous juicy Angus steak, a red pepper disguised as a tomato and a tomato pretending to be a grape.



Indonesia DAY 11

Written by: Sanne Jonker

We had to meet at the bus at 8 a.m. and left with our passport and team shirt to PT Dirgantara Indonesia. After a laborious trip because of the Asian African conference in Bandung we finally arrived. We were not allowed to bring our phones and cameras and had to leave them at the entrance. At a meeting space we were introduced to some of the employees of the company and introduced ourselves, were given a presentation and were shown an interesting video about the company.

PT Dirgantara is an aerospace company involved in the design, development and production of civilian and military airplanes. It was founded in 1976 as a state-owned company and has expanded its knowledge since then to telecommunications, automotive, maritime, information technology, oil and gas, control and automation, military, simulation technology, industrial turbine and engineering services.

Last we were allowed to visit the plant itself. It was very interesting to see how the airplanes are made. A lot of accessories are made by hand, which we were told to be normal for this type of manufacturing. Even the Airbus parts are being made by hand. The company was very close to the airport, so we even were able to see a lot of planes landing and taking off.

Then we went to the next place in our program: The Tangkuban Perahu volcano. The name Tangkuban Perahu means 'reversed peacock'



and is an active stratovolcano 30 kilometres North of Bandung. The volcano is 2084 meters high and erupted for the last time in 1983.

We tried to get some lunch on the go, which was harder than expected. About 25% of the group did not get any food, which was impossible to explain to the waiters. After a lot of discussion we got all the food, although some had to eat it in the bus.

The volcano was very nice, despite all the men who tried to sell us as many souvenirs as they could. There was a little sulphur lake, which we could not reach but we could walk around it. And then, just before we were planning on leaving a fog came over us and we couldn't see anything anymore.

The last visit of this day was the Saung Anglung Udjo. This is a school which tries to maintain the Sudanese culture. We saw a really nice



show with Wayang puppets, music, singing and dancing. At the end we were even invited to join them. Of the main instruments used was the Anglung, a Sudanese instrument made of bamboo. At the school there was a gift shop of which we made very good use. All proceeds directly go to the school, so that it hopefully keeps existing for many years.



Indonesia

DAY 12

Written by: Douwe Visser

This morning we left after our usual fifteen minutes of delay. This time we started one of our longest bus rides of the GBE. A great opportunity for Ronnie to add more pictures to his collection of sleeping people. As we continued our bus trip the views became more and more impressive. That's why we also paused for a short while to enjoy the view. After stretching our legs for fifteen minutes we had to continue, there was only an hour left until we reached our final destination.

After arriving at the national park where the volcano was located, we could not continue with our large bus and our friendly bus driver handed us over to three drivers of smaller vans. But first some of us were seduced to buy a bow and arrow from one of the locals. The smaller vans are properly named smaller vans, as we were stuffed in one van with about nine people, no room was left for anything else. The drivers drove us onto the mountain in what could be called a bumpy ride.

On top of the mountain we could enjoy the crater Kawa Puthi, which is in fact a lake with opaque white water, and a couple of dead trees growing around it. After we, as usual, took a group picture in front of the crater, a few people including me left for a hike through the forest on the other side. With this small group we reached the top of the mountain, and at some point we found ourselves above the clouds. The clouds blocked our views and we



weren't able to see the other groups of the GBE anymore who had been following us up until now.

After reaching the top, and enjoying the view for a while, we started hiking down again. There we were transferred to the entrance of the park by the small vans again, where we had time to lunch and buy some tourist junk from the locals. Afterwards, we took the large bus to the hotel again, a trip which took quite some time.

At the hotel, the group split up for dinner. My dinner this day took place at the top floor of a mall, where I enjoyed a great meal amidst local people. After dining, we had a little bit trouble finding our way. When we finally succeeded we continued our way to the pubs and bars. Here we met other GBE members and went to an Indonesian disco.



A disco is something quite strange in Indonesia, because someone must have come up with the idea to place many different sofas inside these discos. However, there was still enough room for dancing which is what we did. This evening nothing really special happened, besides that the taxi dropped us off at the hotel.





Fysico-Mathematische Faculteitsvereniging

FMF

Sinds 1959

Indonesia

DAY 13

Written by: Nils Wiersema

Today we visit PT Pindad. PT Pindad is a state-owned company founded in 1808. It specializes in designing, developing, engineering and manufacturing all kinds of military equipment. The military nature of this visit proved right at our arrival, because they required official registering using all of our passports and we could not take any phones or cameras. As per tradition, we were greeted with a presentation about all their awesome products, having a special seat for our leader and savior Maarten. These products range from ground vehicles, to airplanes, to special paint, to assault rifles.

Interestingly one of the engineers present had been educated in Delft at the Technical University and could even speak a little Dutch.

Then we received a tour through their factory. Everything was tightly monitored, very military-like. However, after some people asked some blunt and puberal questions, the guides started to open up more, allowing pictures here and there and getting jokes out of them. Eventually someone even convinced them to let us ride the big amphibious vehicles. We weren't allowed to drive them ourselves, but we could sit on the roof, which was a very interesting experience. They also allowed us to climb on and in tanks that were standing around there, which were, unsurprisingly, not very roomy, especially for a tall guy like myself.

After some more persuasion, we were allowed to have a look in their display armory. This turned out to be a very exciting stop for our



group, I don't think everyone was simultaneously as excited at any moment during our trip as they were in this room. Everyone wanted to hold and pose with these guns, so we ended up spending almost one hour at this display building. Very interesting, the appeal guns have on people. Maybe it is just because we are a bunch of nerds who are very interested seeing these guns in the real world, or maybe there is some more universal appeal to all people.

Last stop of the tour was a hangar where they had several helicopters, including huge attack helicopters. Here we took a group picture with all the people present, on some mobile phone because as I have mentioned before, we couldn't take anything with us. Then we got back in the bus and had some nice Bintang to finish the day.

(Fun Fact: We were the first European group of people to ever visit this place.)



Indonesia

DAY 14

Written by: Casper Dijkstra

The Asian-African conference took place in the week in which we were visiting Bandung. It was planned in the area where the Governor's Palace was located (which was literally in front of our hotel) ought to be free of traffic on Friday for the African delegation. For this reason, our group merrily entered the bus at 5 AM, after which the majority of us closed their eyes. By now, most of us had learnt how to sleep rather well in buses.

We arrived in the city Bogor around 11 AM, where our driver was able to park the bus in front of Bogor Botanical Gardens for a couple of minutes. The idyllic piece of nature turned out to be located in the city center. These gar-

dens have been founded during the era of the Dutch East Indies, around 1817. The botanist Caspar Georg Carl Reinwardt from Leiden was in charge of this project, he intentionally chose Bogor for the location of his botanical gardens as the geographic position of this place has the advantage that it rains approximately daily. Even today, the nickname of the city is the 'Rain City.'

We were soon to discover that there is indeed a tendency for rain to occur in this area. As soon as we set foot in the gardens, rain began to fall down. Many of us visited the (covered) animal mini-museum where preserved bears, cyotes, birds and snakes occurring on Java, as well as the skeleton of a whale, could be seen. Afterward many groups decided to go somewhere else, we decided to move towards the Teijsmann Garden. This looked like a peaceful garden with lots of repetitions of its contained flora. When strolling through the garden, the signs



beside the trees taught us that all of them were completely different, thus apparently our eyes weren't fine-tuned enough. The really impressive parts of the garden were encountered later on, for instance an area where lots of different lianas were planted, Bogor's famous Victoria Regia (large green leaves of water-lilies), a beautiful view of the park from a lunchcafé on top of a hill and a tree whose top was entirely occupied by flying foxes. Of course, I severely doubt whether the latter originally occurred in Reinhardt's plans regarding the decoration of the garden, but it was definitely impressive.

Another aspect that the Bogor Botanical Gardens are well-known for has not been found by anyone of us. I am talking about the Amorphophallus titanum, a flower that is said to smell so badly that Indonesian themselves refer to the flower as the 'Corpse Flower.' Despite the horrible stories concerning its odor, the plant itself is said to be magnificent by many botanists.



Unfortunately this plant is very rare - years may pass in between flowering events - and hence we've missed the boat on this one.

Most of us had perceived the park in its entirety (or had simply seen enough) a couple of hours before the group needed to gather by the bus, therefore many of us took a cab to a mall to finally purchase some batiques. This was located in the vicinity of the park, but because it's in Indonesia it has taken us half an hour to get there. When we arrived in our hotel around 7 PM, a laid-back evening with a swimming pool in combination with Bintang was awaiting us.



Indonesia DAY 15

Written by: Rosa Kappert

To me the honor to describe our first day in “the jungle”. Getting to the jungle meant that we had to wake up very early in our little paradise. At six thirty, with small eyes we stood in front of our bus ready to hop on. On this particular day we celebrated the birthday of our chair of the committee, the leader of the delegation, Maarten Degen. As early as six-thirty the group was able to sing enthusiastically for Maarten. The group got him a few traditional Indonesian garments. Maarten thanked the group for their singing and presents and made the announcement that he was very happy to announce that on his birthday Indonesia gave him diarrhea. With this at the forefront of our minds the bus could depart.

During our trip we picked up three interpreters which would accompany us through the jungle. It has to be mentioned that the (by far) best interpreter carried a portable computer that could translate the less common words for her. Because of a slight communication error this picking up caused a minor delay, however we had already learned long ago that communication errors and delays are the Indonesian way of life. The journey to the Jungle was long, but the view was magnificent. We could regularly see the impressive fields of rice, and almost everywhere we could see people on the street, dilapidated ruins called Indonesian houses and impressive, small and large mosques. Notable was that every guy on the street was smoking.

As time passed, our bus was going over increasingly smaller, steeper and meandering roads that kept decreasing in size and increasing in angle. Our amazing driver raced up the mountain with great courage despite the fact that Jim



kept on screaming several times through the bus that the road really couldn't become smaller and steeper. During this trip we got numerous surprised looks from the locals. According to Jos, a group of white foreigners would be equal to a spaceship full of aliens to the locals.

When we finally arrived to the point where the bus could not go any further we transferred to three small ramshackle busses. The road, of equal width as an average Dutch cycle-path, not paved and full of pits and potholes became incredibly steep. What made this jungle experience increasingly exciting was the road that had a steep wall on the one side, and a steep ravine on the other side, but it did not keep the locals from passing forthcoming traffic. This resulted in recurrent vomit stops where professor Olaf compared us to a bunch of scrambled eggs. The view from the top of the mountain made it all worth it, and during the trip we were even able to spot some wild monkeys in the jungle.



When the busses finally arrived, we got lunch in the visitor center near the top of the mountain. After lunch we continued on foot through the magnificent beautiful tea plantations. Sadly we didn't keep it dry, which is not that strange since we were in a 'rain'-forrest. At this moment we were walking through one of the biggest national parks of Indonesia, the size of 130.000ha, from which 700ha was occupied by tea plantations. We found ourselves in the habitat of the Javan Eagle, while we were hearing the lure of the Javan Gibbon in the background.

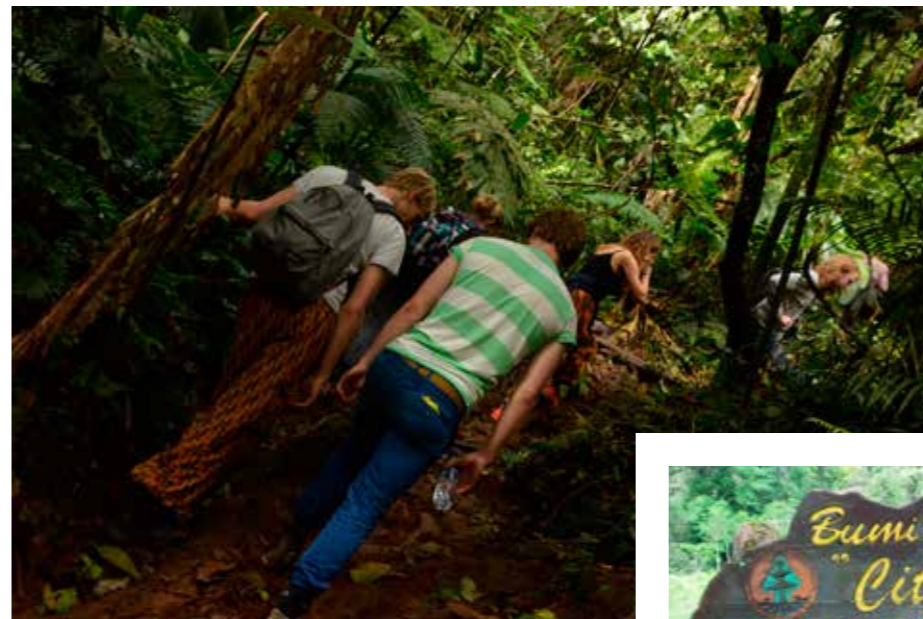
The greater part of the group took took the first opportunity to walk to the 'homestay' but a small group went on to make an additional walk of 45 minutes to take a look in the local tea factory. Arrived at the factory we got offered a cup of tea, and for a small amount we could get a tour through the factory. We were amazed by how provisionally everything was build in the factory. The tea was dried in several steps, and



in between it was carried by hand to the next machine. At the end of the tour, some of us ordered some tea to take home. This could not be done by bag or box, this was done per kilogram of rough green tea.

During the walk back it became pretty dark around us, and we were happy to arrive at the homestay to stuff ourselves with some dinner. The people there were very friendly, however the venue was a large contrast with the paradise-like hotel we left in the morning. These were dreary little shacks that had a very thin mattress. In addition to that they didn't have a shower at all. The venue (and rain?) made some of the participants a bit cantankerous, but during the evening everybody cheered up while enjoying some delicious local snacks. Of course there was no wifi or bars in the middle of the jungle, so everybody participated in old-fashioned games such as 'klaverjassen' and other card-games.





Bumi Perkemahan
"Citalahab"
Balai Taman Nasional
Gunung Halimun



Indonesia

DAY 16

Written by: Lianne Jansen

Most of us woke up in the early morning from the call to go to the mosque. Even in this very small village with all wooden houses, you cannot miss the morning prayer. However, we were lucky to realize that we had about 3 more hours to sleep, so we could close our eyes and enjoy some more hours of sleep on our mattresses on the ground. At 8 o'clock there was a nice breakfast waiting for us, with nasi (of course), eggs, kroepoek, noodles and tea. It was also possible to order tea to bring home from the plantation that we visited yesterday, so kilograms and kilograms of tea were ordered.

At 9 o'clock our hiking tour started. We left the very small village and when we entered the National Park "Citalahab Balai Taman Nasional Gunung Halimun", we saw a pineapple plant, a coffee plant, ginger and some other plants that were family of the ginger. The ginger family had flowers on the ground, so our first special plants were spotted. After we entered the jungle, the group was split into three. Each of the groups had a guide and after him we followed a slippery small path that would bring us to the habitat of the silvery gibbon (Owa Jawa).

We saw for example rotan, that is used as ropes for building the houses, a tree with poisonous saps, a cinnamon tree, a big anthill, a big carcass of an insect and we had to cross a small brook which consisted of drinking water. The big trees, the clean air and the silence continued to amaze us during the whole trip. Unfortunately we did not see the silvery gibbons, but the hiking tour itself was a very special experience.

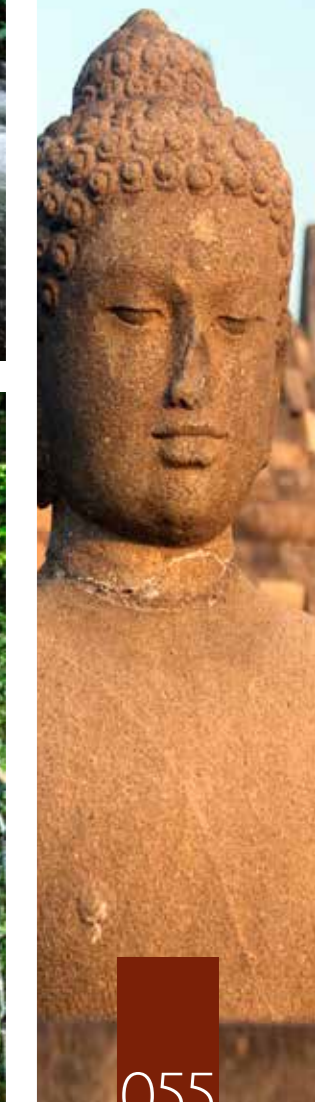
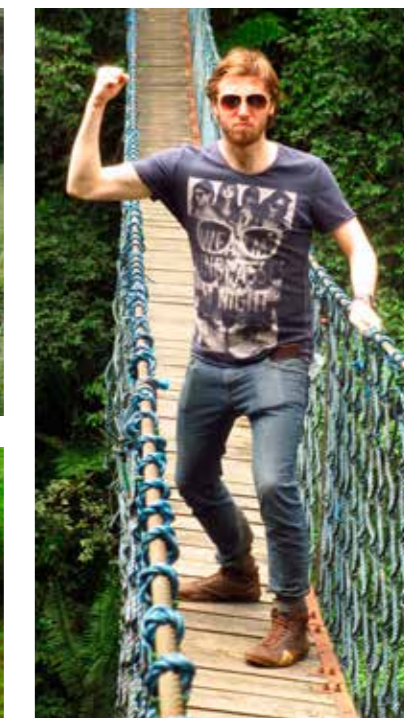


After climbing over and underneath fallen trees, we arrived at a canopy walk in the middle of the jungle. At a height of about 25 meters we walked from tree to tree via small bridges. After this beautiful experience we walked further, we passed the house where we had lunch yesterday and in the end we arrived at a waterfall. This waterfall was called "Tiger water" and some of us entered (with or without clothes) the waterfall to get some nice coolness after the really amazing jungle tour.

From the waterfall the small buses took us back to the homestay. We took some last pictures of the tea plantations and all the nice trees, because it was already time to say goodbye to the wonderful jungle. After having lunch at the homestay, the small busses took us back to the big bus and this big bus would take us to Augusta Hotel, our next destination at the coast.



We arrived after a very long journey at the Augusta Hotel, which seemed very luxury for us. Everybody was happy to see that there were showers (which turned out to have cold water, but still it was nice to take a shower to remove the jungle mud). After we arrived at 8pm we could immediately have dinner from a buffet, but in the end there were quite a lot of people who were car sick after the long and tortuous trip. So not everybody had dinner, but everybody could enjoy the swimming pool or their beds to take some rest and to afterglow the amazing jungle tour.





Indonesia DAY 17

Written by: Arjen Zijlstra

King's Day

Although Indonesia used to be our country, we didn't really see much orange on the streets to celebrate the birthday of the king. On our king's day, we could sleep late until 9 o'clock (which was about 4 hours later than normal). So after a great night sleep, we eventually woke up with the nice beaches of Pelahbahum Ratum across the streets.

Pelahbahum Ratum is renowned for its surfing opportunities, however Indonesian people seem not to know (or to care) about that, you should ask Australians. Unfortunately, the schedule was so busy that we did not have time to try the waves ourselves.

Around 11 o'clock, we went to some hot springs where we stopped for 2 hours, so most of us chose to take a bath. The springs smelled really bad after sulfur and showered with boiling water every once in a while. Some of the group succeeded in finding a coconut which was going downstream and spent their time opening it. In the end the coconut tasted really good. Some others spent trying to turn the tide by building a dike in the current (I mean, we're Dutch for a reason right?).

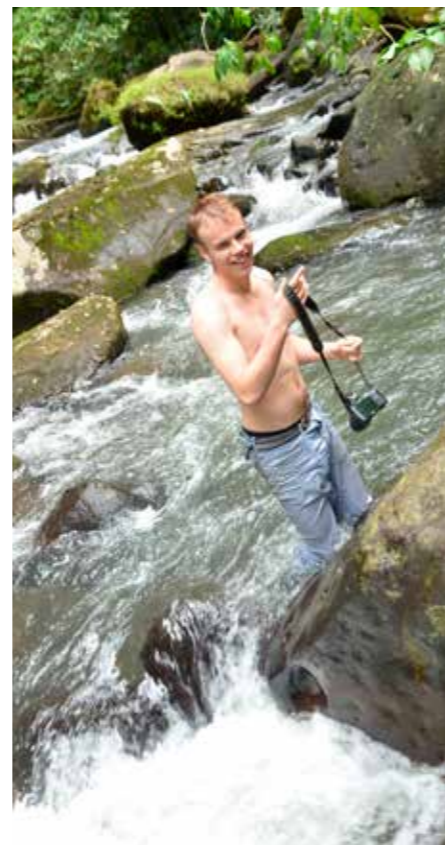
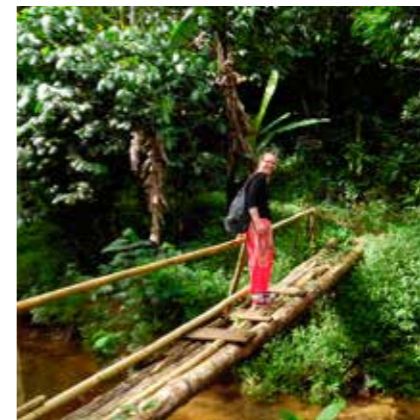
After the refreshing dive and being cooked alive at the hot springs, we went for a long bus ride all the way back to our 'breath-taking' hotel in the middle of the ricefields in Bogor. While a trip 'without traffic' would take around 4 hours, we went Indonesian style, with an average speed of 7 km/h, spending over 8 hours in the bus. Add to this a stop at some random restaurant that only delivered half of the food and we completed our magic formula.



While there was enough time to stop for multiple toilet breaks, we were not able to stop to buy some drinks to celebrate the birthday of the king on our way to the hotel, so we stuck to playing cards, in Dutch 'Klaverjassen'. After about a hundred games, we arrived at the hotel where we had a tremendous dinner with some drinks to celebrate the birthday of the king. After dinner, most of the people went to bed, while the die-hards went on to empty the complete beer stock of the hotel in the name of the King of the United Netherlands!

As a side note, we all agreed he should grow a beard.





Indonesia DAY 18

Written by: Jim Baarslag

Today we would leave the serenity of the GG House and head for the turbulent Jakarta, visiting Universitas Indonesia in Depok on our way. After being treated to a plate of nasi at a quarter past six, we left for UI. As traffic was slightly overestimated, we arrived at the Fakultas Matematika about an hour early. In addition, we were informed that the meeting had been postponed by an hour, so that we now had the perfect opportunity to look around the campus.

The campus was large and green, housed many architectural buildings (even an improved version of our Linnaeusborg), and even provided the visitor with numerous life lessons.

After checking out the campus, our meeting could start. Besides our delegation, many staff and students were present. The meeting was opened by the dean of the faculty, who started by welcoming the distinguished guests prof. Olaf and prof. Herbert and the students. Subsequently, Maarten and Fanna presented Groningen and our faculty, promoting that we “study really hard”. Next, Steven talked about the Casimir effect, with which most of the Indonesian audience was unfamiliar (there were also disappointingly few GBE participants that confirmed to know the effect, when asked), which was followed by Herbert’s talk on charmonium physics.



Finally, the professors and the organizing committee were thanked, and leader Maarten received a gift. Unfortunately, there were no presentations from the side of UI.

During lunch we had the opportunity to mix with UI staff and students, who would afterwards give us a tour of the faculty buildings. While the buildings were very attractive on the outside, the inside was less modern. The Indonesian version of the FMF was just a room with a rug, and the practicals rooms were similar to the Nijenborg’s but with dated equipment. We could also witness a chemistry practical, which seemed quite crowded and chaotic.

Moreover, at UI none of the chemicals are stored in fume hoods, and some chemicals are even stored in the hallways, which the tour guide admitted is not particularly safe. After that we visited the Solid Inorganic Framework group, which mostly works on developing sen-



sors. Our tour concluded with a group photo in front of the rectorate.

Two hours later, we arrived at our final hotel, Citi M in Jakarta, which meant the end of the day’s programme. Most of us spent the evening exploring the neighbourhood, ending up in (fast-food) restaurants, food courts, pool cafes, skybars, and finally the hotel (of which fortunately the beer supply was less easily depleted than in Bandung).



Indonesia DAY 19 - Part I

Written by: Thiadrik Tiesma

This day started way too early. At 6 AM, our rest was disturbed, as we were rushed into the coach. A short while later, approximately an hour earlier than planned, we arrived at Starmas, a company that processes aluminium into finished products.

After voicing our disapproval to the committee (Did we really have to leave our beds this early? Yeah we really had to leave our beds this early. Jakarta rush hour is no joke), we entered the building. The first thing we noticed was the banner that was made for us "Welcome Excursion Team of Groningen University Netherlands".

After marveling at the hospitality for a short while, we were led into a conference room, where we were given the regular introductions and safety briefings, before we could start our factory tour. Some highlights of this tour were the ovens, where the aluminium ignots were molten down and have the alloying added, the rollers, where the thick roll of aluminium plate was rolled out into a foil, only a few micrometers thick, and the extruders, where aluminium cylinders were pushed through tiny holes, in order to produce profiles.

The factory tour was followed by a quick test of the Indonesian inability to say no. In a joking manner, Ronnie and Jaap asked to take an aluminium cylinder and a die home with them. We were not disappointed when, a few moments later, an Indonesian man was seen carefully packaging both the requested items, which were given to us after lunch.



This lunch also deserves to be mentioned. It consisted of pizza, chicken legs and some pastries. More importantly, it did not appear to contain any rice. A relief after two weeks of a rice-based diet.

When it was time to leave Starmas, we reached a very sad moment, not only because we had to leave our very hospitable hosts of Starmas behind, but also because Jaap Eising had to leave for a wedding.

Our journey back to the hotel was uneventful. Due to the very early start of the day, most people were very tired. A quick head-count during one of my rare moments of consciousness told me that the only people with me in the land of the living were the busdriver/assistant. On our return to the hotel, we already reached the end of this day's official program. The unofficial program, of course, was just getting started. I myself went on a walk towards the



old, colonial parts of Jakarta in a small group, traveling through markets and neighbourhoods in various states of disrepair. The colonial parts consisted of some very nice buildings, and some buildings that looked like they might have been very nice a hundred years ago. The end of our journey was the so called English Bridge. It was near this bridge that we went into a hotel called "De Rivier" to enjoy our dinner. Despite us being the only ones present, we still got our very own live-band, with whom we had quite a nice conversation after finishing dinner, while some people of our group showed off their musical skills on the instruments brought by the band. For the journey back home, we found ourselves some tuktuks to take us back home to the hotel, where this day ended.



Indonesia

DAY 19 - Part II

Written by: Jaap Eising

No actual day report here, as the day I had to report on was my sister's wedding, so I had to leave the GBE. "It's only 3 days earlier!" people said, and boy, it did not feel that way when I was leaving. After spending almost 3 weeks with the awesome group, I really wanted to make it to the end.

The tour at Starmas was a culmination of all tours before, with more than ever: "Can you open that?", "Can you flatten this coin in the foil press?" and "Can I take that home?", which ended in me getting a 4 kilogram solid aluminium bar, and Ronnie getting an old steel mold.

However, for me this would be the last part of the program. Before the -surprisingly rice less- lunch I asked for the reception to call me a cab. The nice people of Starmas decided they would just let someone drive me there, as it was "only a short distance". About an hour later he dropped me off at Soekarno Hatta International airport, about 4 hours before I had to be there.

At the airport, one of the first things to happen was that at the x-ray machines I was one of the lucky few to be checked more thoroughly. As it happens you are kind of suspect, travelling alone and with a huge piece of aluminium in your luggage. I was happy to explain that it was for "educational purposes", and for some weird reason they let me go on. Just after that I checked in, and was asked if I wanted to take a flight earlier. As Singapore airport is nicer than Jakarta, I figured this would be nice.



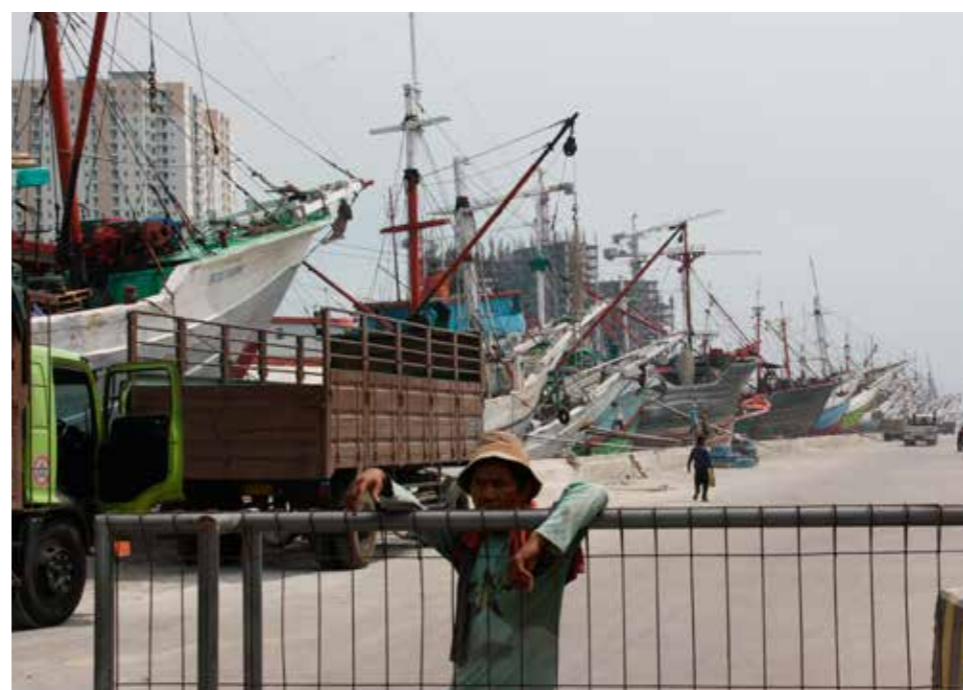
After wasting some phone battery in a cafe with wife, I could board the plane, together with a plane full of very important business people. Because I was travelling alone, my hand luggage had to be checked for drugs again (for the third time). We had a spectacular flight, as there was a thunderstorm over Singapore as we were supposed to land. The flashes in the dark made Singapore look even more awesome than usual.

In Singapore I had to wait for a couple of hours. As the butterfly garden wasn't too interesting at night, I tasted some whiskeys at a shop (I have no idea if that was for non-customers), after which I had one of those at a bar nearby. After this it was time for the main flight, the one taking ~13 hours. As I can't really sleep on planes, I watched some movies (only bad ones, as they had the same movies as 3 weeks before), wasted the rest of my phone battery on music and read the entire in flight magazine.



After landing at Schiphol, I took the train to Groningen, borrowed a phone to call my parents (from a greenhouse expert, who had in the last 6 years worked 4 out of 5 weeks as a consultant in Kazakhstan, who was also on his way back north), and got picked up. That evening I had stampot and it was awesome after all the rice. The wedding was awesome, and I'm glad I was there, but I still really wished I could have been there the last few days, I heard they were as good as the rest!





Indonesia DAY 20

Written by: Lianne van Timmeren

Compared to other mornings, this morning was one that allowed us to have a good night's sleep. Most people's alarms ringed at half past seven. Unfortunately, at breakfast it turned out four people of our group had to stay behind at the hostel because they had become ill. After the committee was assured the sick people could take care for themselves we left for the company DNV GL. There the programme started at 10 o'clock. The people there were very enthusiastic and told us a lot of nice things.

At noon we had to leave for the next company visit. Because we didn't have too much time to eat, DNV GL had made us packed lunches to eat on the bus. This was something we really appreciated. Meanwhile the bus driver had already laid contact with the people of the company we were going to visit next, so he knew exactly where we needed to be. Around half past two we arrived at Pam Jaya, where it turned out we were way too early (meaning we had hurried for nothing!). Unfortunately two members of the organizing committee had to return to the hostel because one of the participants, Joost, had to be brought to the hospital because his condition had worsened.

Around two o'clock we started our programme at Pam Jaya. Pam Jaya is a company that delivers clean drinking water in Jakarta. However, it turned out that only about half the people of Jakarta had access to this water. The water had to be brought down from all the way to Bogor



because the river water in Jakarta was way too polluted to be cleaned back to clean water. After some presentations we got a tour through the facility, which was very interesting in its own way. Something that surprised me was that the water treatment took place outside, where it could once again be polluted by dirty rain water. According to the tour guide this did not affect the treatment process. The treatment process did look a bit primitive, and we learned there was still a lot of room for improvement if all people in Indonesia were to be provided with clean drinking water; something that makes you realize we can be happy that we live in the Netherlands.

Then another downer occurred, when one of the staff participants, Herbert, fainted during the tour. Nobody knew exactly what was going on, and as a result two participants took him to the hospital. We were thus left with only a small group of people, but the programme kept



on going. Luckily we got word from Steven and Maarten that Joost, with whom they'd been to the hospital, had gotten antibiotics to cure him.

After we said goodbye to the people of Pam Jaya we got on the bus and travelled back to the hostel. We had about an hour's worth of time to redress and get ready for the alumni meeting that evening. Once we got there we were still a bit stressed out as to how Herbert was doing. Halfway the evening we finally heard word from Fanna that Herbert was doing a bit better and that they were on their way back to the hostel.

Meanwhile, at the alumni meeting, we had already listened to a few talks and had a nice dinner. It was fun to get to know some new people in Indonesia. The only downside was there were a bit less Indonesian people than we had anticipated. After the meeting we went back to the hostel. Despite the number of sick people, it had been a fun and interesting busy day for the healthy people.



Indonesia

DAY 21

Written by: Lianne Jansen

Today is Sanne's birthday and what will be a nicer present than a beautiful day at a tropical island? Indeed nothing, and so it happened. This day was the day for our trip to the Thousand Islands (a group of about 130 tropical islands in the north of Jakarta).

The day started very early; Sanne obtained the first birthday wishes at the breakfast at 5pm and we had to leave at 5.30am. Some minutes after 6 o'clock we arrived at the pier. Here we could enter a boat, which looked like a bus from the inside.

After about two hours sailing we arrived at the first island of our trip; Pelangi Island (Pelau Pelangi). This was an idyllic tropical island, with palm trees, very clear blue water, some small bamboo holiday homes, views of the other islands and for the rest only silence.

We started walking and very soon almost everybody took a cooling dip. It turned out that there was nice coral and there were beautiful fishes, so quite some people rented a snorkel to have a closer look at the yellow striped fishes, the coral, the starfish and the sea urchin. Some of us stood face to face with Nemo. In the end most of these people were sun burned only at the back side of their body, but the beauty of the sea was worth it. Others took a rest at the beaches, between the palm trees on a sunbed.

It was a relaxing morning and before we knew it, it was already time for lunch at the restaurant. With a nice view of all kinds of fish in the



sea, we enjoyed our rice, chicken, soup and water melon. At half past one we had to go to the boat again, to go to the next island. At 2.15pm we arrived at the next island. This island consisted of exactly one village and we had about three quarters to walk around, have a look at the typically Indonesian small shops, have a look at the residents and to buy an ice cream.

At 3 o'clock we left for our third and last island; Pari Island. This was also a small village. We saw some small old fishing boats, some people having swimming or snorkeling lessons and for the rest all people living their daily lives. We had a small walk through the village and took some rest at the beach. Compared to the idyllic island where we started, this island was very dirty and densely populated, but it was nice to see the traditional villages.



After visiting this last island, it was time to go back. We arrived at sunset at the harbor of Jakarta and around 7 pm we were back at our hotel. Most people started taking a shower and after that everybody was free to go. There was quite a large group who had dinner in the hotel. Joost and Herbert also joined, as they were fortunately feeling a bit better. After dinner most of us could sleep very well after the nice, sunny and relaxing day.



Indonesia

DAY 22

Written by: Fanna Lautenbach

The last full day in Jakarta and of our trip had arrived. We would explore the city of Jakarta with all its wonders. We could sleep in a little but still we started a little later than planned because our tour guides Rico, Steve and Suprie were a bit delayed with the preparations. Joost was still sick so he had to stay at the hotel unfortunately.

The tour started with a small introduction of the guides and a summary of the tour we would do. First we went to the harbour of Sunda Kelapa in the north of Jakarta. "This is the birthplace of Jakarta" Rico told us. He mentioned many more small facts on our way to the harbour. After the visit we went to the museum Sejarah Jakarta in the old town Batavia. The museum

used to be a Governor's house and we could see the many Dutch influences. During the tour we also saw a very bad Wayang doll show about Romeo and Juliet. We were all happy it only lasted a few minutes.

We left the museum and walked over the busy Taman Fatahillah square. A nice restaurant was reserved for our group and we had a great meal. Unfortunately Symen had to leave us after the lunch because he felt a bit sick.

Our tour continued outside the old town to Emmanuel Church which used to be called Willems Kerk. A nice Indonesian lady who spoke a little Dutch told us that there's a service in Dutch every Sunday at 10 o'clock. She also told us that the church was 167 years old and that the organ in the church was the first one ever in Asia.



Next up was the largest mosque in Southeast Asia, the Istiqlal Mosque in central Jakarta. Our treasurer Steven had forgotten about the dress code for that day, so he had to wear a robe which looked very funny on him. It was very impressive to see the mosque on the inside with all the people praying. The tour guide told us that there were five floors for different purposes of praying. The first one is where you had to say: 'There is no other God than Allah and Mohammed is the messenger of Allah'. The second floor is for donations. The third where you pray five times. The fourth floor for one month of fasting. The last if you're going to Mekkah.

Opposite the mosque was the cathedral. We couldn't go in because there was a wedding going on, but we did take a peek inside. It looked very beautiful.



The last stop we made was at the National Museum of Jakarta. We walked through it very fast because it was almost time for the museum to close. There were a lot of statues and old artifacts. We were informed that people used to believe that a dragon/lion statue would get rid of evil spirits. We also saw pictures of old Indonesian tribes where some men had tattoos, which meant that they had killed people.

On our way back to the hotel we drove through the Central Business District with all the tall buildings and beautiful lights.

After a little bit of freshening-up we walked from the hotel to a nearby restaurant D'cost VIP. Maarten gave a little speech since it was our last meal together. The food was all right but unfortunately they didn't sell any alcohol. That's why the committee agreed to have one last drink in the hotel lobby since the official program had ended. Some people went to bed



after the drink and some went clubbing in Jakarta city. One of them who went clubbing was Casper and he was accompanied back to the hotel by a lovely Indonesian lady. Overall it was a great day even though we were all a bit sad that the only thing we had left to do was travelling back to Holland.



Travel day

DAY 23

Written by: Tobias Mulder

I am given the questionable honour to report on the very sad day which was destined to be the 3rd of May. We all knew, despite the first sentence having rhyming so beautifully, this day would come and go, and when gone our return to the cold, grey country full of people with an aloof attitude would be a fact. Some of us made sure the last day and/or night was used properly, by going out and buying souvenirs for our loved ones (including ourselves).

The prize for the most notable souvenirs has to go to both the angklungs and big puppets. Many of us also managed to improve their wardrobe by colourful pants and shirts, which may or may not have been made in Indonesia.

At two o'clock (Indonesian time) we gathered in the lobby to do a last check on our passports and visa, after which we left for the airport of Jakarta. At this airport we ate our last real Asian meal for a while. Note: author does not intend to discredit the food served in the airplane in any way, but still believes this is an accurate statement.

After lots of waiting we took the airplane to Singapore, where our lovely committee realized we all might have an opportunity to claim 40 Singaporean dollars of shopping money (equivalent to upwards of 25 euro) after which all hell broke loose. None of us cared about being late for our flight to Amsterdam and desperately tried to find the spot to get the right coupons.



We managed after a while, and after some pushing and minor injuries we all managed to buy some very useless stuff for free. This was the last pleasant surprise for the day, a very long flight to the small country we call home would be in front of us.

The rest of the day consisted of failing to find a good posture to sleep and watching some movies you never really intended to watch, while enjoying salted peanuts and rocking the most hideous socks produced by mankind.

Because of the different time zones it is debatable when the 3rd of May was over, so the author will just end the report here. It has been a pleasure to inform you of an amazing three weeks



Travel day DAY 24

Written by: Klaas Hakvoort

23.55 PM, Singapore time, technically still Sunday, the plane took off from Changi Singapore Airport for our final flight of the trip. We were heading home, our cameras and storage devices filled with many photos taken, our diaries filled with notes (for, amongst others, these reports) and our minds filled with many great memories of the last week. It was a shame it had to end, but on the other hand, it was good to finally head home again. One can only stay on vacation (ehem, I mean study trip) for so long, and I think many were longing for home, where they could sleep in their own beds, wake up at their own time (not 4.00 AM in the morning), and have dinner without rice.

On board the plane, dinner was served. As we already had dinner on the flight from Jakarta to Singapore, this was our second dinner, but I did not mind, I'm always hungry. After dinner, it was again time to sleep. Fortunately, the seat next to mine was empty, allowing me to use (or abuse) both seats to make a small couch. This time around, I slept a lot better and thus completely missed the, apparently heavy, turbulence that this flight endured. The plane still did not allow for a full night of sleep, however. Around 7.00 AM, the plane touched down at Schiphol and after waiting to pick up our luggage (ours was apparently stowed at the back of the plane) and a short trip through customs and immigration, we arrived in the arrival hall and THE END???

Yep, as several of us were picked up at the airport by their parents or SO's, this was the end for our journey as a complete group. Those who were not picked up headed for the train station

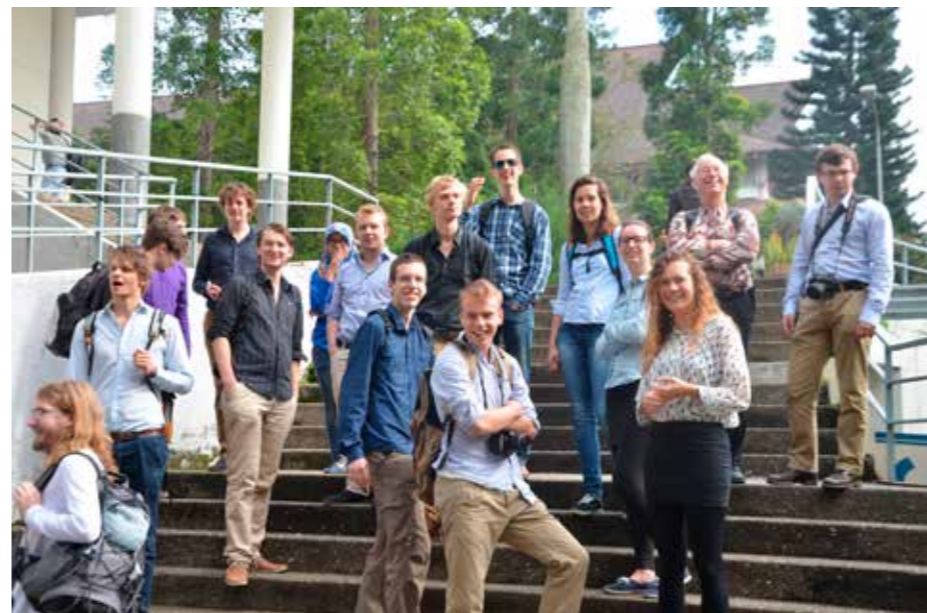


and took the first train towards Groningen. On board, we discussed how everyone would be spending that day, how to avoid jet lag, but also what they liked (and perhaps disliked) about the trip.

At Lelystad, I said my final goodbyes, and got off. Here I was picked up by my mom and we drove home. The day was spent recounting the trip to my brother and (grand)parents, having a 'Dutch' dinner (i.e., without rice), before I became so tired I went to my bed. Lying in bed, I replayed back the trip in my mind, reliving the awesome times we had together during this GBE and at last concluding that yes, this trip was worth getting out of at 3.00 AM for three weeks on end, for I sure as hell would not have wanted to miss this.

So, if anyone asks you if you would like to go on KBE or GBE, say yes, 'cause I'll ensure you, you'll have the time of your life!







Organizing Committe



Chairman Nèsos '15

Written by: Maarten Degen

In this account I will present my views on the journey from my viewpoint (as if I could do it otherwise). Looking back on my time as a chairman of the Nèsos committee, what I am most proud of are of course the people in the committee. The business commissioners were, at the start of the academic year, so busy with calling a whole list of companies that they could almost sing along with all the hold music tunes. Steven was busy keeping a strict account of the revenue and expenses and gathering funding to make the journey happen. Lianne was calling Indonesian companies as early as 6:00 o'clock in the morning due to the time difference to get the programme complete.

As a chairman my main responsibilities are being aware of all activities that are going on and make sure people actually do something. Also, I had to keep the team spirit up and get all of my (stubborn) committee members on the same page. This was sometimes (not often) a hard task because we had a variety of people with different opinions, which is not a bad thing because different views and a discussion about them will lead (hopefully) to the best solution.

An example of a complex decision was determining the destination of our trip. Almost all committee members wanted different things, this led to discussions and different competitive presentations about different countries during our committee meetings. It took some time and some effort to get to a decision on which everybody agreed: we are going to Singapore and Indonesia!

Then we opened a bottle of our finest blue label whiskey and smoked Cuban cigars (all thanks to Lianne who provided us with these goods) to celebrate such a great milestone. A milestone that was achieved on time!

Once we announced our destination it was not that hard to obtain participants and also finding staff members went fairly easy. I guess the decision of our destination was indeed a good one. Obtaining case studies, on the other hand, was somewhat harder than expected but it was great to see how all committee members were helping the business commissioners in their quest to provide all the participants with a case study.

Finally we had a case study for almost all participants, however a next hard task was already heading our way: getting a full scientific and cultural programme. Essential for a good scientific journey but not an easy task, especial-



ly when you imagine that all the professors in Indonesia tend not to respond to students. The ratio of outgoing email:response was in the case of Lianne mailing about 5:1, while when our helpful staff members emailed it was about 1:1.

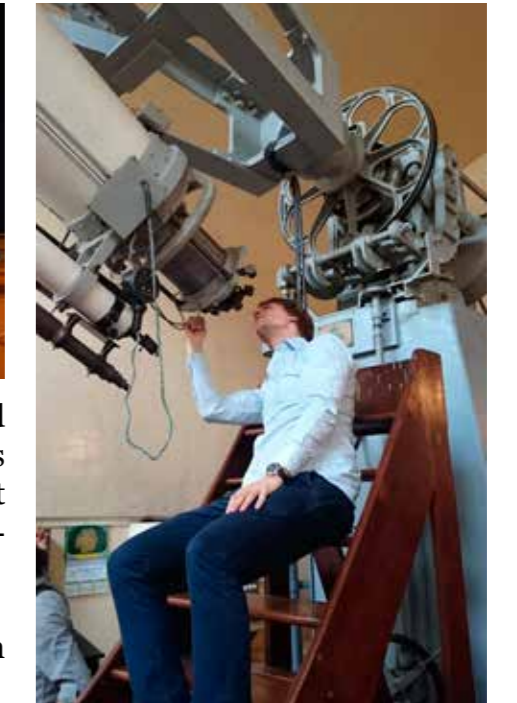
Especially in the few weeks before departure the programme was our biggest concern, however, as we saw the date of departure getting closer we were getting more and more excited as a group. We were also somewhat surprised that the excursion we had been working on for so long was finally about to begin. Finally we succeeded in obtaining a proper programme with a few open spaces but we were able to fill them in during the excursion.

I can conclude that some things were just very hard to arrange properly, especially with people in Indonesia. For instance, we had no official confirmation that a bus with driver was available for us in Indonesia at the moment we were



already flying to Singapore. Some things had to be taken care of during the trip, other things were already agreed upon way in advance but this made it exciting and challenging to organize this trip.

In the end I am really satisfied and proud with what we achieved!



Treasurer Nèsos '15

Written by: Steven van der Veeke

It was a multi-sensory extravaganza that tells the epic tale of five committee members that make a journey of courage, mystery, discussion and surprises. For the participants of the trip, this sounds an awful lot as the description of the Wings of Time laser show in Singapore, and indeed organizing something like an intercontinental excursion for twenty-eight people feels like an ongoing spectacle that has surprises you in each chapter.

The very beginning goes way back to February 2014 where we have been appointed to organize the next GBE. We were a team with very different backgrounds, and we didn't know each other as well as we do now. Quite fast we were

discussing the possible destinations of the GBE and after two weeks of lively and fiery discussion we settled on the destination: GBE Nèsos '15 would go to Singapore and Indonesia.

Looking back on that decision I can safely say that (at least my expectations) were so far off the real thing. You can look up a lot of beautiful pictures, interesting cultural highlights and leading technological companies, but you are nowhere near the real experience. Later during the organization we came to know the real countries with the struggles we had to overcome to end with the program we had.

I want to share two particular events of the trip that made a great impression on me. In both occasions it caused some stress, but now, after the trip they are one of the 'good stories'. The first event was the Indonesian bus. Lianne had been trying to arrange some kind of transportation in Indonesia. About two weeks before the

trip we realized as a committee that it was kind of important to have something like a bus, so we made it a top priority to arrange a bus. Sadly even with the dedication of the whole committee we were not able to book an Indonesia bus. April 11 came, and we departed with the group to Singapore, without a bus in Indonesia...

It was a bit easier in Singapore to arrange stuff in Indonesia because there is a smaller time difference. After another afternoon of calling we got a vague Indonesian contract in which we had to fill in our credit card information. Sending a filled in form back, we received some sort of confirmation in Indonesian language. Although this was the best we could get, all of us were still not sure if the bus would show up on arrival in Indonesia.

On April the 19th we flew to Indonesia, anxious, fingers crossed that the bus would be ready at the airport. Arriving in Indonesia we



encountered our second memorable event: we had to pay for a visa! What!? We had only been informed that we should have paid for a visa in Singapore. As treasurer I was not financially prepared for this. With twenty-eight people behind customs at a small, crappy Indonesia airport and no money at all, it was not the most ideal situation as a treasurer.

Scraping our last money together, we could bribe the customs officers with our Singaporean dollars and pay the visa of three people: Jos, Fanna and me. Our first experience when we left the main entrance of the airport was the dreadful, stunning contrast with Singapore. After localizing the few ATM's nearby we started draining all the bankcards we had brought with us. We had to collect IDR 13.750.000 to pay all the visas. The large collection of banknotes did not fit in our three wallets, and while the locals were lurking at us, we divided the cash among our wallets, pockets and bras.



Finally we got back at the group, could pay all the visas and everybody left the airport. Outside, we were fortunate, our bus was awaiting to drive us to the hotel.

Looking back on the organization of the GBE, it became absolutely memorable by the effort of my fellow committee members. Maarten, chairman with his never ending enthusiasm which could motivate us at any time, Jos, Business commissioner, persistent in every task, never backing out something that had to be arranged, Lianne, program commissioner, thorough and precise to make sure that everything is planned in great detail and Fanna, Business commissioner, causing the necessary sensation within the committee.

GBE Nèsos '15 was quite the experience, intense and amazing and totally worth it!



Business commissioner I Nèsos '15

Written by: Jos Borger

In the GBE-committee Nèsos I was a business commissioner together with Fanna. We were responsible for acquiring the case studies and for controlling the case's progress. When I think back on the committee and the time we spent together I can only say that we had a really nice and fun group of people and that I am really proud of the end result that we have achieved: a cool study trip towards the other side of the world for a relative low price.

The low price is achieved by doing case studies of about 120 hours at companies in the Netherlands. 120 hours is a strange amount of time because it is too short to really train someone to do something specific and for an 'easy' project it is cheaper to hire a temporary worker instead of a relatively expensive FMF student. This is why finding the case studies turned out to be much harder than I expected.

One of many cool things of the GBE is that you, as a committee, get to pick the destination yourself. This led to some brainstorm sessions where we presented all sorts of cool ideas to each other. The middle east, Africa, Japan and Antarctica all came to mind but in the end we concluded that the combination of Singapore and Indonesia was the best choice.

I remember the first time I had to call companies and how nervous I was. It felt super unnatural to call people and basically sell them some-

thing, this took some time to get used to. It is also a good exercise in getting rejected since out of 100 companies only 1 would be somewhat interested. During the GBE preparation my most stressful moment was after the summer vacation when it turned out that we were really behind on schedule when it came to cases. I am proud that we did not give up but worked incredibly hard to still be able to realize the trip. All this hard work payed off and in a short time we acquired a lot of cases which provided us with the funds to actually go on the trip.

All in all being a business commissioner was really fun. You got to visit all sorts of companies and meet all sorts of important people. One of my coolest memories from this was when I visited a big company in Friesland where I was dropped in the boardroom and I had to, unexpectedly, give a talk to the board of directors. Later on the CEO himself gave me a tour of the plant.



The focus of your hard work as a business commissioner is a long time before the actual trip. This meant that during the trip I did not have to do so much apart from being responsible and sometimes being the leader of the day. Unfortunately I was leader of the day during the day that we had a minor crisis. On this day two committee members took one of the participants to the hospital so we were with only three. Then a professor became ill during a visit to a company. He had to be taken to the hospital as well while the rest of the participants needed to be lead to the rest of the program, this was stressful but we succeeded.

The trip itself was a series of wonderful events that flew by. I had a great time and have some really good memories. We combined interesting company and university visits with great cultural activities and saw so many great things.



Business commissioner II

Nèsos '15

Written by: Fanna Lautenbach

After successfully organizing the introduction camp with Steven, he asked me to organize the GBE 2015. I was interested right away but was concerned about the costs. 'If that's your only concern, I will lend you the money' said Steven. A few hours later my application for business commissioner was send to the foundation. I wanted to be one of the business commissioners because I didn't really have an idea what companies, where the participating studies end up, actually do. I also love traveling and organizing events, so the ability to do this together was the perfect opportunity for me.

During the first meeting with the other committee member I knew we would be able to organize a wonderful trip because of our diverse qualities. Maarten was always the one to keep us sharp and to motivate us in the right way. Steven always had a tough opinion but also made sure we laughed a lot. Lianne was like the mother of the committee, keeping us in check and paying attention to detail. Jos was my partner in crime and the one who preserved the right ambience within the committee.

The task of Jos and me as business commissioner started right away. We sat at a little office called 'The KNOB' and spend hours emailing and calling companies. At first, we were kind of anxious because we had no idea what to do. The first case, we managed to get a participant to do it, without even knowing the destination of the trip! After that we worked hard and helped each other out, what eventually led to enough cases for our trip to get the GO from the foundation.

In Singapore our schedule was tight and busy. I was the group leader on the first day in the beautiful city and also due to the travelling, I felt tired. I organized a boat trip with a laser show at Marina Bay to end our first day, but my eyes were closed the entire time. After a good night's rest, I woke up and sat down with a cup of coffee next to a seventy year old lady, also staying at the hostel. She told me she had been travelling since she was fifty. She told me a story about being robbed in Kuala Lumpur and another about being an English teacher in the jungle of Indonesia. Every day in Singapore I woke up a little earlier to sit down next to her and listen to her amazing stories.

In Indonesia I was amazed by the attention we got for being a 'bule'. An Indonesian word to describe a foreigner, especially people of European descent. Everywhere we went people wanted to take pictures with us and talk to us. I also wanted to communicate with them so that's



when my lessons, given by our bus driver, in Indonesian started. I will always remember the happy faces of the Indonesians, after me saying a few words in their own language to them.

After all it was an amazing journey with great people and a great committee. I will always cherish this experience. It taught me a lot about myself and my qualities. I will remember the trip on its own as well as organizing it and being a business commissioner, as one of the best experiences in my life so far.



Program commissioner Nèsos '15

Written by: Lianne van Timmeren

In February 2014 the moment was finally there: I started as Commissioner Excursion Programme of the GBE committee. Together with Maarten, Steven, Jos and Fanna we were supposed to organize a study trip outside of Europe. During the first couple of meetings were supposed to think of the country we wanted to go. This was a difficult task within a committee, where 5 different people have their own dreams. Yet we had to agree with each other. After some presentations and arguments we agreed: we were going to Singapore and Indonesia.

After this decision we could start organizing the trip. While Jos and Fanna had to start searching for companies in the Netherlands that would provide us with case studies, I had to start searching for companies and universities to visit in Singapore and Indonesia. After the summer break the real work began, and for me it was time to contact universities and companies in Singapore and Indonesia. This was really difficult, for them I was just a student, no one important. Because of this I asked Tim, Olaf and Herbert for help in contacting the companies and universities. This was a good choice, because with the title of "Professor" you can reach a lot more people within those countries.

Slowly we found some universities and companies that agreed to let us pay them a visit. Even with the help we received it was difficult to plan such activities: three company visits in Singapore were planned when we were there already! After planning most of the company and uni-

versity visits we could continue planning the cultural parts of the excursion. For us, as the organizing committee, this was the nicest part. Since Singapore is not that big of a nation we were able to plan visits to the most important cultural sites in Singapore. This was really fun to organize! In Indonesia it was more difficult to plan the most beautiful cultural visits, because that country is really big and driving in Indonesia is not very doable. After contacting some Indonesian people we were able to make a good choice of which cultural activities to plan in Indonesia.

Following some busy weeks we were ready to leave the Netherlands on April 11. For the committee this meant two committee members were responsible for the activities each day, while the other three could just relax and participate in the programme. In Singapore we really did a lot of nice activities. For me the two activities I liked the most were the boat trip in-



cluding the laser show and the view from Marina Bay Sands Hotel. I really enjoyed the stay in Singapore: the city is really clean and safe, and because of the high buildings you often had a nice view over the skyline of Singapore!

The difference with Indonesia couldn't be bigger. In Bandung there were not that many high buildings, and there was a lot of poverty. Visiting the toilets in Indonesia usually was a big challenge. We stayed in Indonesia for two weeks, so we were able to do a lot of things. Visiting the Saung Udjo music show was really nice. Nearly everyone of us bought a Anklung to bring home.

I really enjoyed going to Thousand Islands and snorkeling there as well. We even saw "Finding Nemo"! Of course we had a lot more nice activities, you can read everything about them in the daily reports in this book.



For now there is just one thing left: thank you everyone for helping us to organize this trip! And Maarten, Steven, Jos and Fanna it was nice to organize this trip with you all!





Staff members



Herbert Löhner

Written by: Herbert Löhner

“They don’t even answer!” said Lianne, activities commissioner, a bit astonished after so many attempts to get in touch with selected companies in Singapore and Indonesia by telephone and politely written emails, but she never became desperate, continued persistently working hard until the mega-job was done. A culturally and scientifically attractive program was the result. This strong, almost professional, attitude characterized the great dedication of the whole GBE committee in preparing and running the program of Nèsos 2015 and making the journey a full success.

Truly, this excursion was a big challenge due to the large differences in climate and culture, compared to home, but also in attitude and mentality of people to meet. After many personal contacts during the trip, the gain in experience and in understanding was even greater.

All participants were in a very good mood and eager to absorb the contrasting manifold of impressions. On the one hand side, we experienced the big-city life of an exotic and rich Singapore with two renowned universities, research centre A*Star, Renewable Energy Corporation REC, to name a few, the busy financial centre, and the enormous harbour.

On the other side, we got an impression of the poorer Indonesia, the “real-Asia”, as one of the Singaporeans told us. Here indeed we felt the warmest welcome, got an impression of terrific countryside and busy city life, got insight, e.g., in the production facilities of PT Starmas and



PT Pindad, and learnt about the problems and challenges to supply the population of Jakarta with healthy clean water at Pam Jaya. Having seen the pollution of Jakarta’s open waters, an understanding of environmental problems was inevitably created.

Educational and scientifically most valuable were the many personal contacts with staff and students. Students usually live on campus, are mostly busy with their studies, and are educated to the needs of government and industry. Singaporean students expects a bright future and mostly find a job in industry after the bachelor studies; campus and modern research facilities appeared attractive to our students, so that some would consider an exchange study in Singapore.



In contrast, facilities in Bandung and Jakarta appeared less well equipped and sometimes outdated, however rich in historical instruments and facilities like the Bosscha Observatory in Bandung. Indonesian students are not so sure about their future and very well willing to spend some time at a European university.

The contrasts and comparisons were eye openers for our students. After presentations by students and staff from both parties, the informal get-togethers with students in Bandung and Jakarta were very fruitful in creating a mutual understanding of each other’s living environment, university curriculum, and career perspectives. Some roots were planted to stimulate exchange of staff and students, in particular at Universitas Indonesia in Jakarta.



Olaf Scholten

Written by: Olaf Scholten

The success of an excursion lies in the planning as well as in the participants. From the good times we had in Singapore and Indonesia one can only conclude that the planning was excellent and that we were a group in good spirits.

The planning was complicated by the fact that many of the contacts could only be established at the last moment, greatly to the displeasure of the organisers, but at the end all worked out punctually. I guess this is part of the learning experience: in not all countries is one used to planning a month in advance. In this respect, we very fortunately could make use of Tim Zwaagstra's aid and advice.

As the person responsible for the RuG's academic contacts in South-East Asia his extensive network proved very valuable, We learned quickly that personal contacts are necessary to organize visits to the various universities, industries and other organizations.

We can look back at a very interesting and successful excursion. Success in this sense applies to the number of contacts we have been able to make and the very valuable impressions I am sure we all carry with us from this trip. A few weeks after our visit to Universitas Indonesia we were happy to receive a counter visit to initiate a lasting collaboration between the two universities. In addition a student from the Institute of Technology in Bandung is now completing part of her Master program here in Groningen.



An important aspect that really contributed to the mutual contacts is that at the universities and some of the consultancy firms the program allowed for ample informal contacts with students and employees. This gave us a good idea of what life is as a student or an expat there. It also allowed the students we met to see what is involved in studying at the RuG.

I was personally very impressed to see the huge differences between the two neighbouring countries Singapore and Indonesia. One is a compact city state while the other is comparatively much more rural. There are large differences in wealth, in daily life, and in organisational aspects. Both countries have in common that the tropical abundance of nature is very important. In Singapore we saw this in the impressive Domes in the Gardens by the Bay, in Indonesia at the Bogor gardens and Gunung Halimun-Salak National Park.

Foundation GBE-FMF

Written by: Ronnie Tamming

Fysisch-Mathematische Faculteitsvereniging is the umbrella organisation for both the big foreign excursion (GBE) and the small foreign excursion (KBE). Once every two years a destination outside of Europe is chosen, and the other year within Europe.

Five brave committee members started the, seemingly impossible, mission to organize the GBE. After a year of hard work, the result was impressive. First one week to the huge condominiums of Singapore with all of its grandeur.

To get the feet back on the ground after this heavenly place the delegation went on to Indonesia, to the island Java. The difference in culture was shocking. For example, the committee had to get millions and millions of Indonesian Rupiah somewhere near the airport to pay for the visa in cash.



During the trip there were no major problems. Some participants became sick and even had to stay in the hotel. One day was very stressfull for the committee since one of the participants needed to go to the doctor and the committee had to split up. During this, another participant became sick and had to go to the hospital. However the committee did what they had to do and in the end everyone was fine.

Highlights during the trip were the Alumni meeting in Singapore, visiting Sentosa Island, sunset on top of Marina Bay Sands, the Saung Udjo, walking around at Kawah Putih, the jungle trip and the visit to the thousand islands. All of the highlights are now written down and shall always be remembered.

At last we'd like to thank to committee for organizing this amazing and never-to-be-forgotten journey!

Financial Report

Written by: Steven van der Veeke

This financial section is dedicated to inform you on the finances of the GBE nesos '15. As a treasurer I bring you, with a mixed feeling of pride and defeat, all the financial transactions of the whole excursion condensed down to a profit and loss statement. This is the operating statement per 1 November 2015, and it is expected that this will be the final statement of this excursion. I bring you this with pride because the whole excursion is summarized by barely one A4 of paper, and with defeat because the work of one year seems futile when you only consider this final statement.

Before continuing it must be stated that the Faculty of Mathematic and Natural Sciences has been of utmost importance to this excursion (and a large portion of previous excursions). The revenue model of this excursion is based on the case-studies performed by the participants. As can be seen from the pie chart on the next page, 56% of the income is due to these case-studies. Although this model has proven to be successful, it causes a shortage in liquidity because not all case-studies are finished or even assigned at the moment of departure. A natural consequence is that the earnings of those case studies are not yet received by the committee, and hence causing the aforementioned shortage in liquidity. Luckily the faculty has approved our request for an interest-free loan, and thus allowing this excursion to take place.

During the preparations we settled on a slightly higher price per casestudy, which turned out not to obstruct us in finding enough casestudies, or funding of this excursion. This raise obliged us to replenish the provision for cases, which is partly used as liquidity and partly as a safety net, to the norm of two casestudies, which explains the expense on “provisions cases”.

The costs of living in Singapore are more or less comparable to our hometown Groningen. Indonesia on the other hand is far cheaper than our precious hometown. During the preparation the committee had spent a great amount of effort on negotiating with our partners to get the best prices and most tight deals. Besides the savings of these negotiations, this did also bring us a great deal of financial security.



At the moment of departure departing the financial prospects were very bright and after a few pieces of good fortune during the trip the committee could not “proverbially” burn the money fast enough. The participants should not have fallen short on anything, and still we couldn't reach the bottom of our wallet.

Right after returning from the excursion, the prospect was that the committee would make a dazzling profit of €10.670,35. Because the foundation under which the committee operates is a non-profit organization, naturally this profit would be distributed among the donors of the excursion. Eligible donors of this profit are the subsidiaries and the participants.

The efforts that have been put into getting the best deals have been proven to be of use after returning. The committee suffered some setbacks in the execution of case studies, which lowered the profit by a considerable amount.



As a result of this, the foundation has taken a portion of a profit to invest it in making future contracts with participants and companies legally binding. Secondly this money will be used to translate the contracts, so that this excursion will be equally accessible by internationals students as it is to the Dutch students.

A few years ago, the Faculty of Mathematics and Natural Sciences has made the decision to make the transition to an English bachelor and master degree program. During this GBE there were no non-Dutch participants, but already at the next KBE that is being organized in the spring of 2016, there will be international students and hopefully this will be true for the next GBE as well.

Lastly I would like to thank the sponsors and companies who provided the case-studies once more.



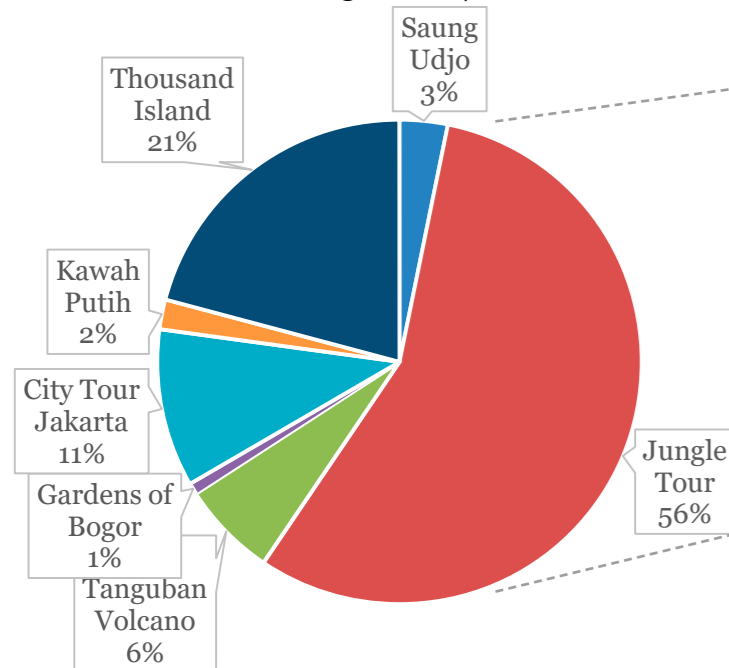
Thanks to them we could organize this amazing trip to Singapore and Indonesia, and not only we, but many other committee's in the past and hopefully in the future have and will use this generosity and goodwill to execute such a study-trip.

Steven van der Veeke,
Treasurer Nesos '15

Financial Report

A total of **\$8.410** Singaporean dollars and an impressive amount of **Rp85.950.000**

Indonesia Rupiah has gone through the hands of the Treasurer during this trip



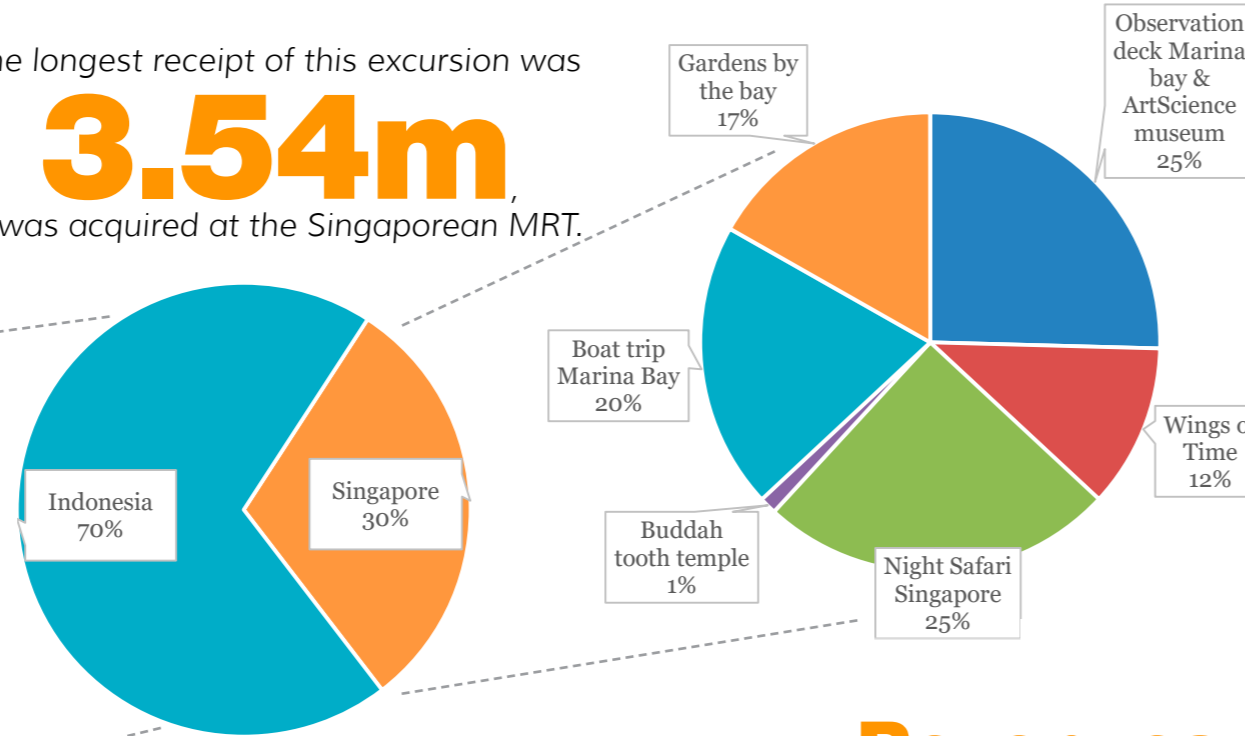
The most of expensive excursion of this trip was the the jungle tour which costed

€3780,-

And surprizingly, the second most expensive excursion was a the boat tour to "Thousands Islands" arranged by a guy named "Donny". The boat trip costed:

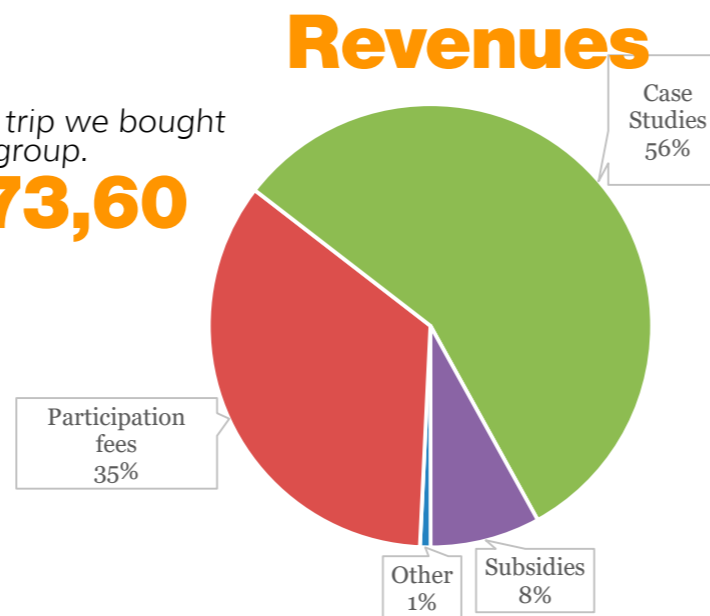
€1449,-

The longest receipt of this excursion was **3.54m** and was acquired at the Singaporean MRT.



On two occasions during the trip we bought coffee and tea for the whole group. In Singapore this costed **€73,60** In comparission, in Indonesia this costed

€6,75



Revenues		
Provision GBE '13		€ 527,41
Participation fees		€ 24.702,48
Scientific Staff	€ 3.160,00	
Students and committee members	€ 21.542,48	
Case Studies		€ 40.200,00
Allseas Engineering		
Energy Integrated		
University of Groningen		
van Wijnen		
Incas3		
Schut		
StudioVO		
Center for information technology		
Fugro		
Noordhoff Uitgevers		
Landustrie		
Molgenis		
SKF		
NAM		
UMCG		
Sensata		
Subsidies		€ 5.717,48
FMF		
CTN		
JBI		
Kapteyn		
ZIAM		
NNV		
GUF		
FOM		
Niemeijer		
EPS		
KVI		
Graduate/undergraduate school		
Interest		€ 12,06
Total		€ 71.159,42

Expenses		
Organization		€ 2.673,12
Participant meetings	€ 858,33	
Banking	€ 693,60	
Foundation	€ 1.080,50	
Cases	€ 19,20	
Other organisational costs	€ 21,49	
Printing		€ 1.462,46
Final report	€ 1.000,00	
Other print- and copy costs	€ 462,46	
Representation		€ 1.503,87
Gifts foreign contcts	€ 538,20	
Shirts	€ 564,69	
Promotional	€ 204,98	
Committee clothing	€ 196,00	
Other		€ 27.892,09
Plane Tickets	€ 24.678,00	
Transport Netherlands	€ 530,60	
Vaccination costs	€ 1.687,62	
Visum costs	€ 995,87	
Stay		€ 9.629,17
Stay Singapore	€ 4.720,02	
Stay Indonesia	€ 4.575,40	
Phone costs	€ 143,21	
Tips	€ 190,54	
Meals/pocket money		€ 13.133,09
Meals Singapore	€ 5.166,07	
Meals Indonesia	€ 1.982,25	
Pocket Money Singapore	€ 2.957,95	
Pocket Money Indonesie	€ 3.026,82	
Excursions		€ 9.647,10
Singapore	€ 2.908,41	
Indonesia	€ 6.738,69	
Transport on location		€ 5.018,52
Singapore	€ 1.390,02	
Indonesia	€ 3.628,50	
Provision		€ 200,00
Provision Cases	€ 200,00	
Totaal		€ 71.159,42



Case Reports





Allseas Engineering

Written by: Jaap Eising

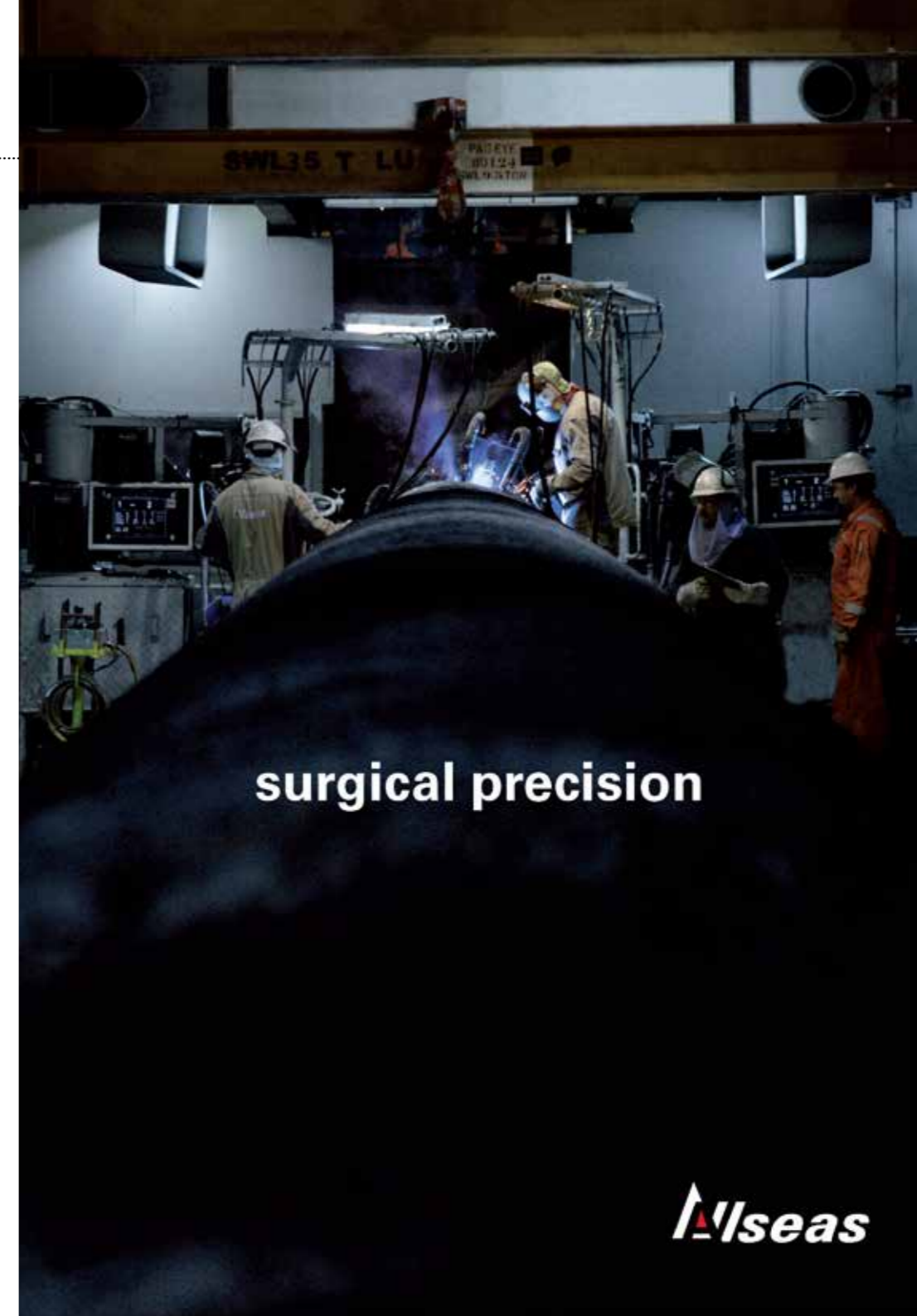
Just like Joost I've done a case study for Allseas Engineering. You may have heard, but they have recently had the largest ship in the world built, the Pioneering Spirit (although when we were working on our cases it was still Pieter Schelte). The idea behind this ship is that it can lift an entire oil rig in one go. This makes disassembling them a lot easier, as it can be transported to land instead of having to do this on open sea. In addition to their GPS systems they wanted to investigate whether they could use lasers to measure the relative orientations, and therefore the distance between the ship and the rig.

To do this I wrote a program (unfortunately in Matlab) and used this to investigate a couple of different setups. The program takes any two shapes, and then, based on a couple of measurements (i.e. the locations of a few points of the second shape), calculates the rigid transformation (rotation and translation) of the second shape with respect to the first. After this it uses an algorithm to find nodes of the shapes that are less than a certain threshold away from each other.

I investigated the precision of a number of setups, for example using more lasers to correct potential errors (as the lasers are better at finding distances than angles), or even using only two dimensions (as we figured the sea might not rotate a 400 million kilogram ship and a 50 million kilogram rig as much).

On top of all that the program had to be optimized, as it would have to be running in real time, and 10 seconds more could be the difference between being able to steer the ship right and crashing a 2.4 billion euro ship.

All in all it was an awesome case to work on, and it was nice to see they really took me seriously. They haven't implemented the system yet (the case was more a proof of concept), but I really think something vaguely based on what I've done might be used in the future.



surgical precision

Allseas



Energy Integrated

Written by: Symen Theo Jousma

In 2007 dr. R.W. Bussard presented his research on the Polywell, an alternative for the well-known fusion techniques. Bussard started doing research on this technique in 1986. The inspiration of this technique comes from stars, where fusion takes place under the influence of a radial force. Bussard was convinced that this technique could also work on earth. With the help of funding of the American Department of the Navy Bussard build several reactor prototypes to extensively study the potential of this technique.

These reactors use a set of positively charged electromagnet coils arranged in a six sided cube. The magnetic poles are pointing inside the cube as a result of which electrons can be

trapped inside by the magnetic field, much like a wiffle ball. This creates a negative potential, which attracts positive ions. As the ions accelerate towards the centre, their kinetic energy rises. If the ions collide in the centre, they fuse.

Energy Integrated is a company which shows much interest in this technique. Their goal is to gain as much knowledge about this technique and its possibilities and with this raise the awareness for funding for future research. One of the key aspects that that make the Polywell reactor special is the outlook that this reactor can possibly facilitate the boron-11 fusion reaction. This reaction is an aneutronic fusion reaction, which means that the residual products only consist of highly energetic ions and no neutrons.

Successful aneutronic fusion would greatly reduce problems associated with neutron radiation such as ionizing damage, neutron activation and requirements for biological shielding,

remote handling and safety. Next to that boron is found not only in the Earth's crust but also in seawater. If successful this promises to be a safe alternative for nuclear energy and, due to its abundance, a good candidate to solve the world energy problem.

For my case, I further studied the boron fusion reaction. Where the technique to perform such a fusion reaction was of importance, the main focused of my case lied on the supply chain of boron. I tried to give Energy Integrated a further insight in the boron market by mapping the global sources, stocks, production processes and uses of boron together with the key players within the market. I came into contact with companies that produce boron and a research group who are building a Polywell reactor.

The end product was a report which Energy Integrated can use to further create awareness for research to the Polywell reactor.

University of Groningen

Written by: Thomas Rinsma & Arjen Zijlstra

The University of Groningen uses a system called ProgressWWW where students are able to enroll for courses, view their results and vote for university- or faculty-wide elections. This last aspect is quite separate from the others and the Progress team would like to separate it entirely. Our task is to build a prototype for this election system using a combination of some techniques that Progress already uses and others that we could choose ourselves.

Important to note is that ProgressWWW is not only used by the University of Groningen, but also by a lot of other educational institutions. Our election system has to support the customization requirements of these institutions. We've implemented a system which consists of a single page containing one or more elections if available and applicable to the user. Each of these elections contains a list of candidates, grouped by their party. Besides their name and affiliated party, candidates can also enter occupation and motivation, and upload a personal picture. This way we can make a better and more direct link between the drive of the candidates and the voting itself.

To make sure that voting is performed fairly, some form of authentication and anonymity is required. A voter should be eligible to vote only once and nobody should be able to know what he or she voted. We've started theorizing the best way to implement such a system.

So far we've implemented the most important pages and functionality of the system. We made the interface responsive to make sure that it is also usable on mobile devices.

We also included an option to use a more simplified view and not include candidate pictures in the page. Additionally, work has been done on the back-end, but more work is needed on both the connections to the database and on the login system we use.

In the coming weeks we will work on this and everything will be done before November 1st.





Van Wijnen

Written by: Thiadrik Tiesma

This case study was done at Van Wijnen, a dutch construction company, specialized in building new homes. As they were building their new warranty portal, they realized that a lot of time was spend building the files that had to be imported, this being a tedious, repetitive job, which had to be done accurately, or else the import fails.

In addition, most new-build homes are based on the same template, with only small differences between them. This makes the construction of these import-files ideal for automatization. For my case, I had to deliver them a way to quickly produce these import files. To do so, I was given the file of a previous project, which was made by hand, and warranty lists.

With these I build a database of all components and a number of queries which would cover all of the standard newbuild homes, as well as some requests often made by customers. This database combined with excel magic would produce correct import-files for most new-build homes, the exception being ones including uncommon requests made by customers, which can be manually included.

Furthermore, I wrote documentation describing the inner working of the database, the queries and the excel-magic as well as step-by-step instructions on building the import-files.

This way, the time spend building the import-files for a project has been reduced from several hours to several minutes. All in all, this case turned out to be a fairly straight-forward and practical one.



Doen

In een markt vol dynamiek blijven we doen waar we goed in zijn: ontwikkelen, bouwen, onderhouden en beheren. We leveren mooie projecten op en beginnen overal in het land met nieuwe huisvestingsopgaven. Stuk voor stuk projecten waar we trots op zijn. Waarvan we vol overtuiging zeggen: dit is wat wij doen. www.vanwijnen.nl





Incas³

Written by: Natascha Koelewijn

My case was for a company called Incas³, an expert in the field of remote monitoring. Too much wind, too hot, too cold or too humid the climate in our immediate environment is important in determining whether the working environment somewhere is nice. This microclimate is strongly influenced by the location of buildings, trees and roads. Together with the municipality of Groningen and support of the Zernike Campus park management a project was started to map the microclimate of the campus using an extensive network of sensors.

The knowledge gained can be used for the planning of new buildings and vegetation, thus contributing to a pleasant climate and therefore making Zernike Campus Groningen more comfortable. Groningen has achieved a first: it is the first time that such a project is carried out in the Netherlands.

In collaboration with Incas³ employee Victor Stoica I worked on one aspect of the on-going study they perform at the Zernike Campus. This aspect involved the human experience of the microclimate. Even though that in theory an environment should feel pleasant, personal factors can come into play that influence the experience for the visitor of a certain area. The case included a pilot survey to investigate which factors that come into play are the most interesting to examine. The goal was to at least provide feedback on the existing survey and a positive extra would be gathering information that could already prove useful for the whole microclimate research itself.

The survey consisted of a questionnaire and a map. Contents of the questions were in the lines of: are you student/staff? If you have, how long have you lived in Groningen? How often do you visit Zernike? What is the purpose of your visits? The map was for the final question: where do you generally perform these activities? After harassing all the employees and students still active during the summer break in the Duisenberg Building and at the ACLO there were enough results to provide Incas³ with feedback on their questionnaire and mapping method.

So maybe in the near future or in a few years, this pilot was the fundament of research on the human parameters involved with the experience of the microclimate and we are rewarded with a beautiful and improved Zernike Campus. I will gladly take your thanks and praise for that at: natascha@fmf.nl ;)



INCAS³ is a non-profit, independent research institute focused on the reliability, reduction of energy usage and the applicability of sensor systems in open environments. To reach our ambitious goals, we are looking for excellent scientists, engineers and PhDs.

INCAS³ scientists and engineers are strongly encouraged to build international networks to truly excel in their research. By participating in international projects and spending research periods in internationally leading institutes, INCAS³ researchers are actively building up a knowledge base on par with top international standards.

INCAS³ is always looking for talented and ambitious PhD candidates. We encourage graduated master students to put forward their research ideas. Innovative proposals that could contribute to the INCAS³ knowledge base will be rewarded with a pre-doctoral research position for a period of six months with the potential to develop into a PhD project.



Detailed information at www.incas3.eu

INCAS³ is co-financed by the Ministry of Economic Affairs, the Province of Drenthe, the European Fund for Regional Development and the Municipality of Assen.



Schut

Written by: Isabelle Tan

The case-study that I performed was provided by the company Schut Geometrical Metrology. They are specialized in the development, production, sales and services of high precision measuring instruments.

For their instruments they are interested in replacing the old glider and roller bearings with so-called air bearings. Instead of oil or rolling elements, this type of bearing uses a thin layer of air to reduce the friction between two surfaces. In order not to disturb these high precision measurements, the bearings need to satisfy certain stability requirements. The different designs of air bearings that the company has tested in experiments so far do not satisfy

these requirements. Therefore they were interested in a computer model that they could use to investigate the flows in air bearings and to eventually determine a suitable air bearing design for their instruments.

At the start of the project the company provided me with a model that successfully calculated the flow around certain designs of air bearings but crashed when used on other designs. The goal of my project was therefore to improve this model such that the company could use it in their investigation of these other designs of air bearings as well.

The model was written in the opensource computational fluid dynamics software package OpenFOAM. I have tried various adjustments to the model such as varying the choice of solvers, boundary conditions and time step sizes, but the best results were acquired by changing the dynamic viscosity of the fluid.

For this strategy we ran an initial simulation in which we used a fluid with a very large dynamic viscosity, namely a 1000 times larger than the realistic value. This resulted in a stable and converged flow through the bearing. Then, we used the resulting flow from this simulation as an initial condition and step-wise brought back the velocity to the realistic value, each simulation with the latest flow as an initial condition. By using this method we were able to produce a flow for a fluid with a viscosity that was closer to the realistic value than we could successfully model from a stationary initial condition. Furthermore, the resulting flow was in line with theory from important pieces of literature.

The company will continue to search for improvements to the model and to the air bearing in order to perform simulations under realistic conditions and to hopefully eventually find a suitable air bearing design which satisfies their requirements.



Schut Geometrische Meettechniek is een internationale organisatie met vijf vestigingen in Europa en de hoofdvestiging in Groningen. Het bedrijf is ISO 9001 gecertificeerd en gespecialiseerd in de ontwikkeling, productie en verkoop van precisie meetinstrumenten en -systemen.

Aangezien we onze activiteiten uitbreiden, zijn we continu op zoek naar enthousiaste medewerkers om ons team te versterken. Als jij wilt werken in een bedrijf dat mensen met ideeën en initiatief waardeert, dan is Schut Geometrische Meettechniek de plaats. De bedrijfsstructuur is overzichtelijk en de sfeer is informeel met een "no nonsense" karakter.

Op onze afdelingen voor de technische verkoop, software support en ontwikkeling van onze 3D meetmachines werken mensen met een academische achtergrond. Hierbij gaat het om functies zoals **Sales Engineer, Software Support Engineer, Software Developer (C++)**, **Electronics Developer** en **Mechanical Engineer**.

Je bent bij ons van harte welkom voor een oriënterend gesprek of een open sollicitatiegesprek of overleg over de mogelijkheden van een **stage-** of **afstudeerproject**. Wij raken graag in contact met gemotiveerde en talentvolle studenten.

Voor meer informatie kijk op www.Schut.com en Vacatures.Schut.com, of stuur een e-mail naar Sollicitatie@Schut.com.



SCHUT.COM



Center for Information Technology

Written by: Rosa Kappert & Casper Dijkstra

In February we have begun our case study pertaining to possible improvements in Progress (versions: .WWW and NET). These are software programs which are utilized by several universities, among which the University of Groningen, in order to enable students to register online for courses and enroll for examinations. After students have made exams, their grades will appear on these websites as well. The aim of our case study was to improve the ease with which the students' study progress can be retrieved within Progress, both for the academic staff and the students.

The students who are doing their first year (propaedeuse) can easily verify whether they are on the right track to complete their first year successfully. The propaedeutic curricula are generally well-defined and have few elective courses, hence they have successfully been implemented in Progress and the students' results can be compared with this list of the 'to do' courses. It can immediately be seen by the university's staff which courses the student still needs to finish successfully and after a student's first year it can be seen which students have (not) obtained at least 45 study credits (for the temporary positive 'binding study advice'). The academic staff knows equally well which students are about to finish their bachelors' degree, since these students are supposed to send their list of completed courses (and those that will be done in the near future) via Progress to the Board of Examiners in order for their study programs to be approved.

Nevertheless, they typically have only vague indications how well or poorly the students are doing in the intermediary study period, because the student's graded courses cannot (yet) be linked automatically to the curricula belonging to entire bachelor's programs. Basically, what can be retrieved from these students is how many credits they have obtained and to which courses study credits correspond. As there is generally no one-to-one correspondence between 180 EC (the amount of required study credits for a bachelor's degree) and graduation for the bachelor's degree, more sophisticated features within Progress are needed to see every students' study progress.

Difficulties arise in the interpretation of the Progress data corresponding to students of the following groups: students who are participating in multiple studies and students who have switched to another study. In both cases, irrelevant study results for their current study occur in their list of results and for students of the for-

mer group it may be the case that a course can be used for both curricula. Furthermore, there are curricular changes which occur throughout the years and optional minors/courses entail that there are many non-equivalent study programs. Currently, courses are not linked to their corresponding studies in Progress, so the list of results is just a long list of passed (and failed) courses. For instance, one can see that a student who is studying two fields of inquiry has acquired 235 EC, but cannot easily see the study progress within one of these studies.

We started our research by interviewing the developers of Progress to obtain familiarity with the whole issue. Thereafter we interviewed ten staff members of different faculties: members of the examination boards, study advisors, policy experts et cetera and we analyzed their experiences concerning Progress in order to get to know exactly what features are absent or ought to be improved in the software. After all these interviews, checking a lot of curricula of

different studies and intensive mutual discussions we had a rough idea of a possible solution. To check what 'the student' thought about the solution and our different refinements we interviewed about fifty students, who turned out to be positive about it. These results brought us to our final solution.

Our suggestion is that entire study programs will be programmed in Progress. Staff from the university can continuously check how the students are doing and the students themselves get feedback within Progress about the courses that still need to be finished. This takes away uncertainties regarding the completeness of their individual study programs and students will not e.g. face the problem that one optional course is considered irrelevant for ones study at the moment before graduation. This solution requires that the curricula from several years ago are to be defined within Progress as well, and that all courses that used to be given are linked to their substitutive courses. Besides

that, all minors that the university offers need to be put in predefined codes.

A working group has been realized, called 'Study Progress', consisting of a study advisor, a member of a Board of Examiners, a programmer and a head of the Education and Examination unit and a programmer, all of whom provide feedback on the feasibility of different aspects of our solution. We have sent them a report in which we have discussed the pros and cons of several solutions, followed by an argumentation why we think that our chosen solution ought to bypass problems that the other solutions would bring along.





Fugro

Written by: Jim Baarslag

Fugro is one of the world's largest geotechnical engineering firms. Their main business is to support the exploration, development, production and transportation of natural resources.

Besides that, they also concern themselves with more general geotechnical problems, such as advising on soil behaviour when buildings and structures are designed. For example, if a bridge is built, they can advise on the bridge's pillar structure given the characteristics of the underlying soil. If, for instance, the soil is very soft, the bridge may easily tip over due to squalls. On the other hand, if the soil is very robust, the pillars may quickly break after applying only a relatively small force.

Therefore it is essential to be able to predict the behaviour of the soil, the structure and the supporting foundation and pillars if some force is applied to the structure.

Evidently, such problems can be solved analytically only in very specific cases. Therefore, in practice they have to be modelled numerically. Certain software packages are developed for exactly this purpose, but all of them have their drawbacks. For that reason, it is useful to not be limited to only a single programme, but rather to find multiple programmes that are suitable. The aim of my case was to examine whether the implementation of the programme OpenSees would be feasible and useful.

In order to assess the applicability of OpenSees, some simple example problems had to be simulated, of which the experimental results were known. This was not straightforward, first because as a theoretical physics

student, my knowledge of soil and engineering mechanics was zero (not even the concepts of stress and strain are taught to us); and second because one has to know the obscure TCL programming language to work with OpenSees. To have any idea what I was doing, I started with reading something about engineering mechanics and soil dynamics, both of which are not treated in my study programme. After some messing around, and after fixing many bugs in the programme, the first results came in.

Fortunately, those seemed reasonable. Subsequently, another example problem was simulated, and several different approaches were tried. The resulting outcomes were successful and increased our confidence in the programme. The programme is at present actually being used for projects by Fugro.

Noordhoff Uitgevers

Written by: Maike Jaspers

To be allowed to travel to Singapore and Indonesia with the GBE, I did a case study for Noordhoff Uitgevers. Most of us will know this company by its previous name Wolters-Noordhoff, who has not seen this name in (at least) one of his/ her school books?

My task during this case was making PowerPoints of the theory blocks of the mathematics books of the different versions of VMBO. The mathematics was of course not difficult for me, but it took some time before I knew all the tricks of PowerPoint. Most of the animations in PowerPoint are not quickly made and it can soon take 15 minutes to make it really beautiful.

It was also pretty tough to find a nice balance between the different goals of the PowerPoints. How do you make a PowerPoint which explains the theory clearly for high school students, which is a good tool to easily work with for teachers, which meets the stile and wishes of Noordhoff and is good enough to be approved by the authors? Because the theory is especially for VMBO students, it is very important to explain everything step by step, with a lot of animations and examples, to make the mathematics more interesting.

It was a nice case where I could use my creativity and learned a lot of the educative aspects behind mathematics.





Landustrie

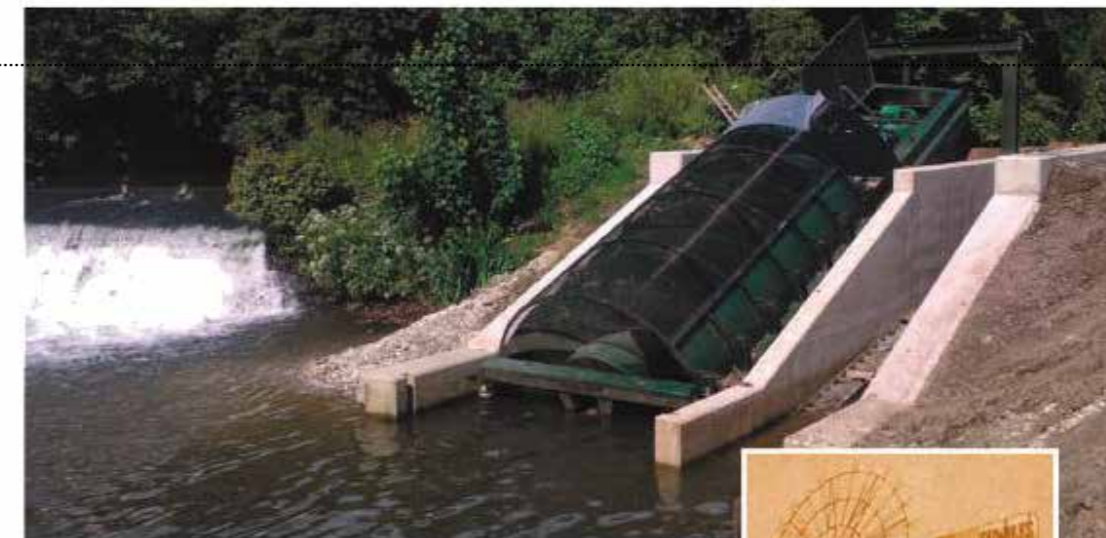
Written by: Douwe Visser

My case study is about the optimization of a hydraulic jack. When Jos offered me this case he had given me a German book from which I could read the topic of this case study. Soon when I began to read this book, I found out that my German language proficiency was outright bad. But on the other hand I came to the conclusion that the problem of a hydraulic jack fascinated me, and at the moment of writing it still does.

Now I have made progress in this case study I found out that studying and understanding the German book wasn't enough to fully understand and handle the problem concerning a hydraulic jack. Because of this, I had to consult some other sources that could shed light on the problem of this case. With the help of the literature I was able to translate the problem of optimizing a hydraulic jack into an integral that had to be solved.

However, understanding these steps were not that trivial, and there were no examples available, so I had to do it myself. Doing so, you need a large amount of calculus knowledge that you didn't learn during the typical calculus classes. This is because of the non-trivial shape of the hydraulic jack.

To solve this very difficult integral you need numerical methods. The combination of different challenges make this case study very interesting. Moreover the company is very helpful and relaxed. At the moment of writing I am not done yet, so sadly I cannot enlighten you with the results of the case. What I can tell you is that, without a doubt, I would do this case all over again.



meer dan 100 jaar watertechnologie





Molgenis

Written by: Nils Wiersma

Molgenis is an open source project to manage, explore, integrate and analyse data, specifically aimed at life sciences. The code base is maintained and primarily extended by a group working under the Genomics Coordination Centre in the University Medical Center Groningen.

The project offers multiple ways of interaction, among them multiple APIs and also an HTML GUI. The nature of the software allows remote access to this HTML GUI (a website). This openness to world, however, comes at a price: holes in the software could creep in, which allow access to unknown entities. This is undesirable for obvious reasons. Additionally, the databases can be filled with very personal in-

formation about patients, as life sciences often involve disease information of human beings.

To test for these holes, companies often hire professionals who will test for commonly known vulnerabilities, trying to get around the security of a system. This process is called penetration testing, or pentesting. Two of these common vulnerabilities are SQL injection and Cross Site Scripting (XSS), respectively ranked as vulnerability number one and three by the Open Web Application Security Project (OWASP). For this case pentesting has been performed on the Molgenis project looking for these vulnerabilities.

SQL injection has to do with database querying. Information in databases is accessed using queries. In the SQL world, this is done using the SQL syntax. This syntax is very intuitive, explaining the popularity of the language. In the simplest form, the queries look something like `SELECT [field] FROM [table] WHERE [some condi-`

`tion]`. Many web applications have some database running in the backend, which can be queried like this. Typically some user input is used in these queries. In vulnerable systems, this input is then put directly into the query (hence the name SQL ‘injection’). Because the query is then evaluated and executed, the input is executed as well, which can be any arbitrary code.

XSS is a different kind of injection. It involves putting ‘scripts’ into a webpage, which is then executed in the web browser of its users. This is possible because the HTML uses tags to tell the browser how to interpret text. One of these tags is the script tag. If an attacker manages to insert code along with these tags into the page, the page is compromised due to XSS.

Some minor parts of the Molgenis project were found to be susceptible XSS, this has been reported to the team. SQL injection was not found.

StudioVO

Written by: Sanne Jonker

I did my case study for StudioVO, a company that designs open digital teaching materials for high school students (age 12 to 18). The main advantage of their material is that it is easy to update; mistakes can be corrected as soon as they are found and topics can be adjusted to recent events. The material is very interactive and keeps the students interested by not only presenting large amounts of text but by presenting photographs, videos and games as well.

The materials are constantly evaluated and once a year they visit several schools and interview a selection of students in order to observe the opinion of the students in addition to that of the teachers. This year I visited two schools and interviewed students from the second lowest (VMBO TL) and the highest (VWO) education level.

The students generally were positive about the material. It was interesting to see how well they adapted to the digitally oriented focus of their classes. The pupils were very pleased with the fact that they did not have to carry a lot of heavy books any more. The material was clear and they enjoyed the assignments they had to do.

They suggested some improvements as well. The videos could be more up-to-date and the pupils of the second lowest level agrees that the reading material should be shortened and that difficult words should be replaced. All students would like to do more practicals, like little experiments out doors.

The comments of the students were very useful for studioVO. They are trying to assimilate them into the current material in order to improve the offered courses even more.



Nederlandse Aardolie Maatschappij

Written by: Maxens van Daalen

This case study is commissioned by de Nederlandse Aardolie Maatschappij and is performed in collaboration with the foundation GBE-FMF for the GBE excursion 2015. The goal of this study is to examine trips occurring in the compressors of multiple gas extraction locations and see if there is a general cause to be found in all or multiple events. The main idea is to focus on Active Magnetic Bearing (AMB) trips, for which no explanation is given in the trip report and study data before, during and after the trips.

The first step in the project was choosing an approach to analyze the data. It was decided to use the R software, together with the R-Studio user interface, because of the ability to easily explore large data sets. A selection of events to study was made, consisting of all AMB trips that occurred in 2014, which constituted a total of 30 events. For all these events a time interval of 40 minutes around the trip time, as indicated in the trip report, was selected. In this way a sub-selection of events could be made, as some events did not show the trip in the chosen time interval. In this way a group of 11 events remained that could be studied and compared.

For these 11 events a group of 56 variables was selected. These included flow, power, temperature, pressure and rpm of components. At this point, the relation between components and working principle of the system was deliberately kept unknown to make the data analysis as unbiased as possible. From here the search

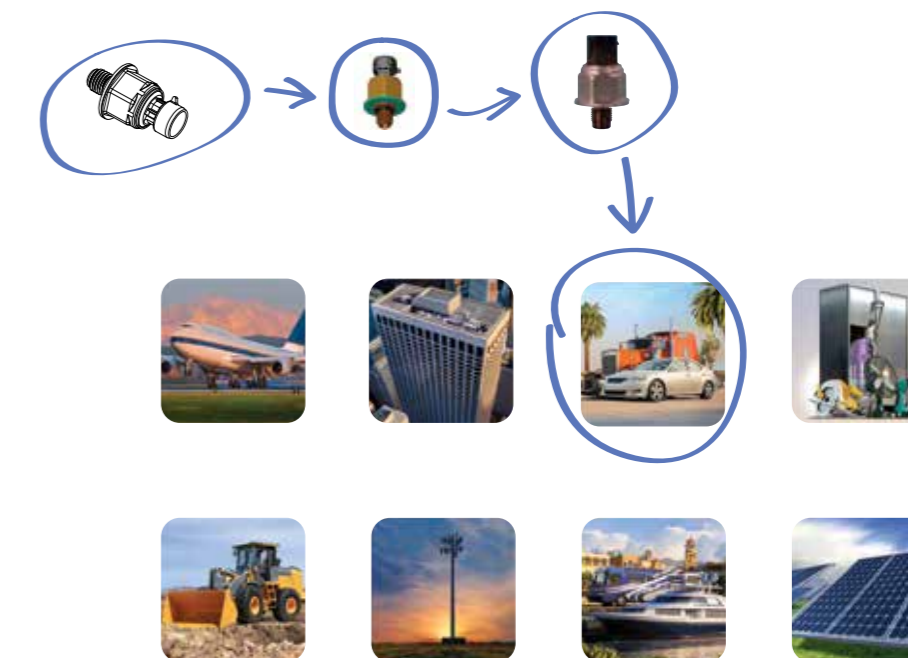
started to see if there was any behavior in the output of the components that occurred for multiple, or even all events, which could be linked to a general cause in the AMB trips.

This same analysis procedure was performed for all components of the other 11 events. From these results there seemed to be a tendency for components with tag number in the 20's to show earliest differing behavior. As a next step in the strategy it was decided to look further into the tag 20 components.

A new set of 85 tag 20 components was selected for further research. A same procedure, as for the original data sets, was performed for the 85 components of the same 11 events. At this point the manual for the system was used to look into the true meaning of the component tags and the connection between different components, to see if a logical chain of events could be linked to the trip. Many of the components showed similar behavior for all events.

This included increasing/decreasing pressure, decreasing temperature, loss of rpm and opening and closing of valves and safeties.

Unfortunately, it proved difficult to link these phenomena to a cause of the trip. Most of the component behavior could be rationalized as a consequence of the shutdown of the system. The behavior of the components provided in the data set is therefore most likely a consequence of the trip and not a cause. The data analyzed thus far also did not give definitive proof a general cause for these AMB trips even exists.



PEOPLE AND PRODUCTS THAT MAKE A DIFFERENCE

The World Depends on Sensors and Controls





UMCG

Written by: Klaas Hakvoort

To fund this trip, I was asked to work on a case at the UMCG, to be precise, at the Research Bureau at the UMCG. The Research Bureau is responsible for handling funds for research and to check on the impact of the articles that are published from this research. It was this last part I was initially assigned to work with.

The impact of an article is largely based on the journal it appears in and in order to find out the impact of each author/researcher at the UMCG, a database has to be created and maintained. (Inter)national standards require that the article appears on Web of Science (WOS) in order to be counted, so to create the database of articles, an enquiry is placed at WOS to download the meta details (title, authors, place(s) of work

of these authors) off all work that has as Location: Groningen and is in one of the medical fields for a specific year. These articles are then run through a tool that tries to couple UMCG researchers and their departments to these articles.

Unfortunately, it is far from perfect. For example, there could be multiple J. Boer working at the UMCG, and automatically identifying the right one that worked on the article is difficult. Also, a doctor could work for multiple departments, but the articles he published may not be relevant for all of them. Lastly, due to a mix-up, not all researchers were in our database/tool and had to be added manually to the database after the initial (automatic) coupling.

The now checked list is then sent off to the heads of department (HoDs) for them to check for missing articles, or errors that slipped past us. When the replies from the HoDs are pro-

cessed in May, WOS tends to be updated and the article can be added.

With the list thus compiled and checked by the HoDs, the part of the case I was brought in for was completed. Since I was short on hours however, it was agreed that I would do some additional jobs related to this literature database. The Research Bureau is not the only part of the UMCG to maintain a literature database, the library maintains its own, separate database of articles published by UMCG researchers. My job was to compare these databases for the years 2011, 2012 and 2013 (~6000 articles combined). It turned out that both databases were missing several articles (5 to 10 % of all articles) that the other database contained.

The library however also maintained its own list of UMCG employees/researchers. Since we (the Research Bureau) had one as well, for the automatic coupling, it was decided that I should

look into them to find out about any discrepancies between them, like there was for the literature database. Immediately, it was clear that there were problems, as one database housed over 20.000 employees versus 6.000 researchers. Secondly, department names in one database were spelled differently, or even in another language (English vs Dutch) than the other. The last one, that really made a comparison impossible however, was that neither database had P-numbers listed for all staff-members. Without this unique identifier of each employee, any comparison had to be done manually. Thus, going down the list of 6000 researchers, and manually checking that they are in the larger list and at the right department.

Due to the time and effort required for such a task, and the low priority of this comparison, it was instead decided to scrap the comparison and thus I was relieved of my duty and my case declared finished.

Onderzoek in het UMCG



Graag willen wij u op deze plek de weg wijzen naar de wetenschappelijke ambities van het UMCG, de aapak daarvan en resultaten die hiermee zijn bereikt.

Het UMCG heeft voor de komende decennia het thema 'Healthy Ageing - gezond en actief ouder worden' als speerpunt gekozen. Dit thema behelst de hele levensloop van voor de conceptie tot aan onze dood. In het UMCG pakken we dit op 2 manieren aan. Door vergroten van het inzicht in verouderingsprocessen en het ontstaan van ziekten proberen we ziekten te voorkomen, daarnaast streven we ernaar dat mensen die leven met een ziekte zolang mogelijk actief kunnen blijven en een zo optimale kwaliteit van leven kunnen behouden. Binnen al onze kerntaken - zorg, onderzoek en onderwijs/opleidingen - werken we gezamenlijk aan deze doelen.

Wij willen dit graag met u delen en hebben hiervoor diverse kanalen gecreëerd zoals Het digitale populair-wetenschappelijke magazine 'Kennnis InZicht' en de lezingencyclus 'Medische Publieksacademie'. Ook kunt u ons nieuws online volgen of vindt u het leuk om de verdediging van een medisch-wetenschappelijk proefschrift bij te wonen of een redevoering (oratie) ter ere van het verkrijgen van de titel van professor. Deze zijn open voor publiek en worden aangekondigd in de agenda.



SKF

Written by: Ronnie Tamming

Bonding/debonding characteristics of non-metallic inclusions in bearing steel. My case study was a assignment for the company SKF, a Swedish multinational specialized in bearings and seals technology. For this case, the inclusions of the bearing steel has been examined.

Society demands more durable and higher quality products. To accomplish this, SKF has certain quality checks to see whether the incoming steel is the right quality. One of these checks is an automated scan with an electron microscope. From this scan, information about the inclusions in the steel can be obtained. These inclusions are microscopic impurities in the steel lattice and are the main cause of cracks in the steel. These cracks may propagate to the surface and thus the bearing will be damaged.

SKF is interested in the bonding characteristics of these inclusions with the steel lattice. Almost no danger of crack initiation exist if the inclusion is well bonded to the lattice compared to the inclusions which are completely debonded from the lattice. These inclusions can be seen as holes in the material, which are a source of crack initiations.

For this research the bonding of the inclusion with the lattice, the size and shape of the inclusion and the composition is compared. The information is obtained with use of the SEM, provided by the Material Science group of the University of Groningen. The combination of the SEM with the XPS provides the information needed to compare the aforementioned parameters.

Unfortunately, no clear relation between the bonding and the other parameters is found. This might be because the 2-D images only show the debonding on the surface while an inclusion might be bonded on the surface and debonded under the surface. Also a lot of the inclusions were too small to obtain the small debondings.



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