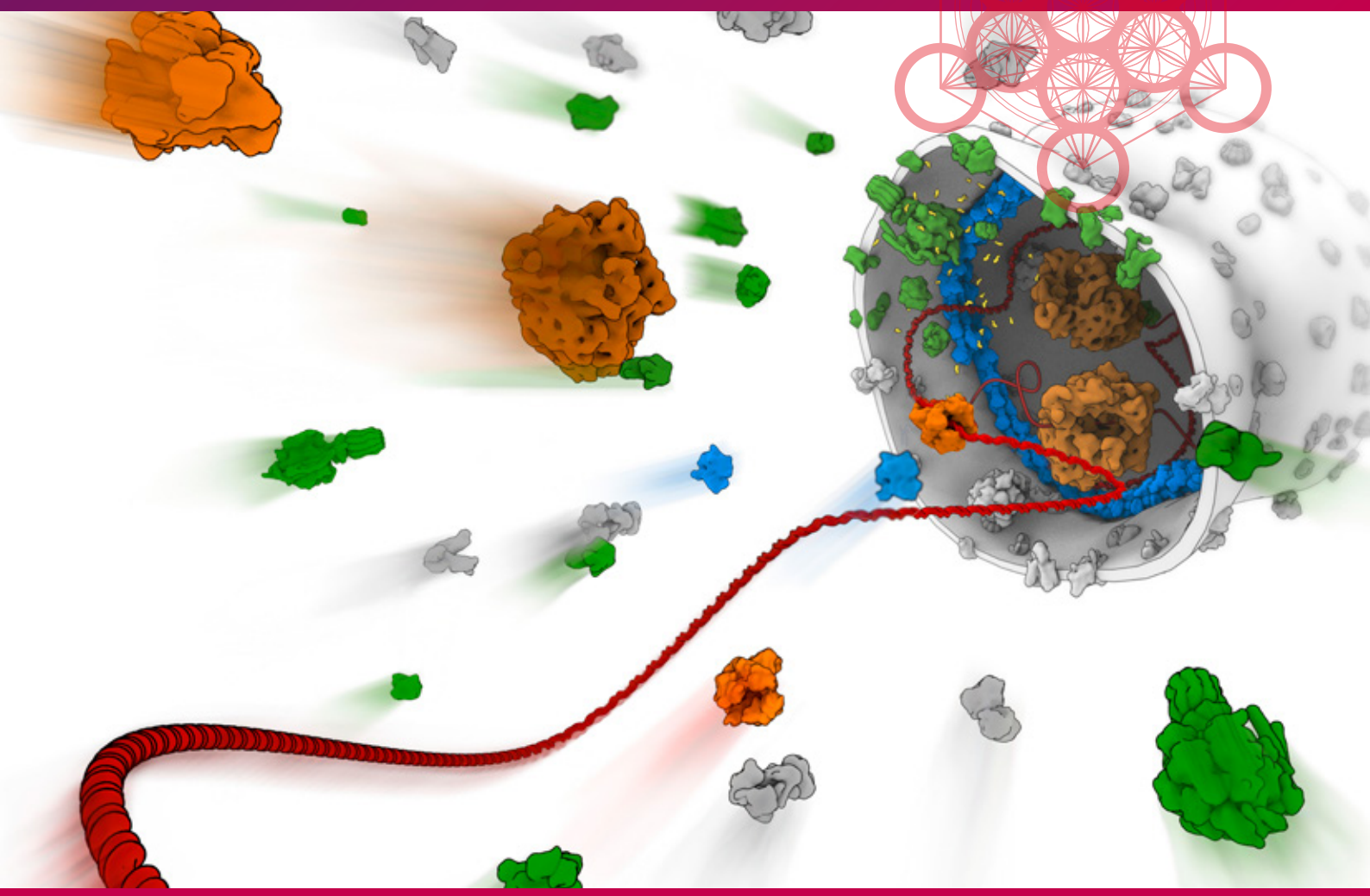
KAVLI NEWSLETTER
Kavli Institute of Nanoscience Delft
No.19
June 2017



IN THIS ISSUE:

Two major grants awarded to our Kavli Institute

We are extremely pleased and proud to announce that two major programmes, 'BaSyc' and 'Q Software', will be funded by the Dutch government for almost 19 M€ each! Through its 'Gravitation Program, the Dutch ministry for Education, Culture and Science awarded, after a intense selection process, over 100 Million Euros to world-class Dutch scientists in six research consortiums. Two of these six consortiums are within our Kavli Institute.

The BaSyC (Building a Synthetic Cell) programme is taking on the challenge of building a synthetic biological cell. Marileen Dogterom is leading the consortium of researchers from Bionanoscience at TU Delft, together with other scientists from other universities and AMOLF. Constructing a synthetic biological cell is one of the greatest challenges facing 21st-century science. We already have extensive knowledge of the molecular building blocks that form the basis of life, but we do not yet understand how they work together to make life possible.

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FROM THE DIRECTORS

And yet more good news for our Kavli Institute! As featured on this frontpage, two major 10-year projects were awarded, namely the national consortia BaSyC and Quantum Software. BaSyC is a 10-year 25 M€ program that will explore the building a synthetic cell from molecular components, while the 20 M€ quantum software consortium will pioneer new algorithms for quantum computers and establish a quantum internet between Amsterdam, Leiden and Delft. In both programs, scientists from our institute are heavily involved.

Looking ahead, we are thrilled to host Alain Aspect from Paris for a Kavli Colloquium. Alain is a true pioneer on quantum mechanics who through a series of fundamental experiments in quantum optics and atomic physics provided convincing proof of quantum entanglement and other basic phenomena. We certainly can expect an exciting Kavli Colloquium. The preprogram will highlight some of the most thrilling students projects at Delft: the famous Nuna, iGEM, and the recent Hyperloop project – all inspiring. Don't miss out on this.

On our Kavli Day, we are honored to have Robert Dijkgraaf as our guest who will speak about "Information from the structure of the universe to biology". Afterwards we will travel to the Biesbosch for some fun activities.

Furthermore in this newsletter: An interview with our inaugural Kavli Chair, Amir Yacoby from Harvard. And a self-introduction by new faculty member Toeno van der Sar, a column by our new columnist Anton Akhmerov as well as from Martin Depken, and lots of other news. Enjoy!

Cees Dekker

COLUMN

Are you open to changing your mind?

Yesterday I had the fortune to listen in on a conversation between two of the smartest and most interesting public intellectuals of our day. Free of moderators or interviewers, the three-hour conversation meandered cordially through thorny issues where views differed starkly. Contrary to the norm in a public debate or interview, the informal setting allowed these people to genuinely try to understand and engage with each other's positions, rather than to try to best each other publicly with bitesize slogans or other oratory tricks.

I have had the privilege to listen in on many such conversations over the past ten years, and it has challenged my intuitions, expanded my horizon, and forced me to reverse and calibrate my views on several important issues. How did I get to be such a fortunate fly on the wall? Am I part of some exclusive discussion society or book club? No, I am a member of the still rather exclusive being-alive-today club (the dead outnumber the living by an order of magnitude), and about 10 years ago I got my hands on a smartphone.

Maybe you are already in the habit of listening to podcasts. A surprising number of my friends were not though, and spurred on by some initial success convincing them to start a new and wondrous habit, I am now urging you to do the same; for your own good, and for the good of society. In a climate where misrepresenting views to demonize your opponent seems an acceptable debate strategy, we must take extra care to listen more to arguments and less to our own gut reaction. Only by listening to the open discussion form offered by podcast have I ever felt I got what the proponents on the "other side" of any issue actually meant, and my world has become much richer for it.

People on the left do not generally want to take your hard earned money and give it to lazy people, and those on the right do not generally want to take money from the deserving poor to line the pockets of the rich. By listening to podcasts by people I do not normally expect to agree with, I have found that people of all stripes want a society where all can prosper. From Ayn Rand to Karl Marx, from Richard Dawkins to the Pope, people seem to differ less in what they consider a good society, and more in how they imagine us getting there.

Through your phone, and any of a myriad (free) podcasting apps available in the App store of your choice, you can now also consume the audio on the move, in the gym, doing the dishes, or while on the beach watching the waves lap against the seashore this summer. If you need some inspiration, my playlist currently contains: *Rubin Report* with *Dave Rubin*, *TYT Interviews* by *The Young Turks*, *Waking Up* with *Sam Harris*, *The Tim Ferris Show* with *Tim Ferris*, *Very Bad Wizards* with *Tamler Sommers and David Pizzaro*, and *Hardcore History/Common Sense* with *Dan Carling*.

Martin Depken

INTERVIEW

Interview with Alain Aspect

On 29 June Alain Aspect will be the guest speaker at the Kavli colloquium. He is Professor at Institut d'Optique and Ecole Polytechique. In the 1980's he conducted the first Bell experiments closing locality loopholes. Now he leads a group in atom optics. I talked to him about a fascination for light, atoms and quantum.

The interface of quantum mechanics and optics

I asked professor Aspect about his motivation to work in photonic during his PhD, and in optics later on in his career.

"When I was a student I was fascinated with light, already at high school. (…) I had a very good education in classic optics and a bad education in quantum mechanics, so I wanted to work at the interface of quantum mechanics and optics. Then I found a paper by John Bell that showed there was an old debate between Bohr and Einstein and that it was possible to settle that debate by doing an experiment." At that time there had already been early versions of a Bell test by Clauser and Freedman, but these experiments did not address the locality loophole. Alain Aspect wrote two articles in 1974 and 1975 containing proposals about how to test Bell's inequalities, while setting the measurement basis while the photons are already in flight. He said about this: "I decided that was the most interesting subject I had ever read about and I found a professor who would take me for a PhD in his lab and embark on this Bell's inequalities test".

I still took seven years to go from proposals to the completion of his first test of Bell's inequalities: "There was the fact that in the lab where I was working no-one had used any of the techniques I needed, so I had to learn absolutely everything by going to other labs and learning how they did it, and moreover I was very short on money so I had to borrow a lot of of equipment. It was fun."

From light to atoms: learning new things

After his PhD, Alain Aspect joined Claude Cohen-Tannoudji to start a lab in laser cooling of atoms. "I thought that playing with atoms and light was just corresponding to what I liked (…) and working with Cohen-Tannoudji I was sure that I would learn a lot of things in quantum mechanics."

"Since 1992 I decided to create a group working with atom optics. It is like playing with atoms like I was used to play with photons as I did when I was younger. (…) The biggest fun or interest for me in this atom optics business is that this field has evolved into condensed matter physics." Again the driving force behind his interest turns out to be the opportunity to learn: "In the lab there was more and more interaction between condensed matter physics and atom and photon optics and I find that extremely interesting, since my background in condensed matter was very small. So I have a chance to learn some new physics, and learning something new is interesting."

Quantum technology

Since the Bell's inequalities tests in the 1980's, new experimental techniques have enabled loophole-free Bell tests in 2015. "I think it is a big achievement of these experiments that they have pushed the technology to a point which is absolutely necessary for quantum technologies." Professor Aspect is one of the drivers behind the European Quantum Flagship, strongly supporting quantum technology. "I think it's fantastic. Nobody knows if a full universal quantum computer will ever work, but I'm absolutely convinced that there will be at least small quantum computers effecting some specific operation. Let's say a microcomputer on a niche operations."

In his own lab he still pushes quantum technology forward through performing tests of Bell's inequalities: "My research group is developing an experiment to test Bells inequalities with atoms instead of photons, (…) namely entangling the velocities of atoms."

Suzanne van Dam

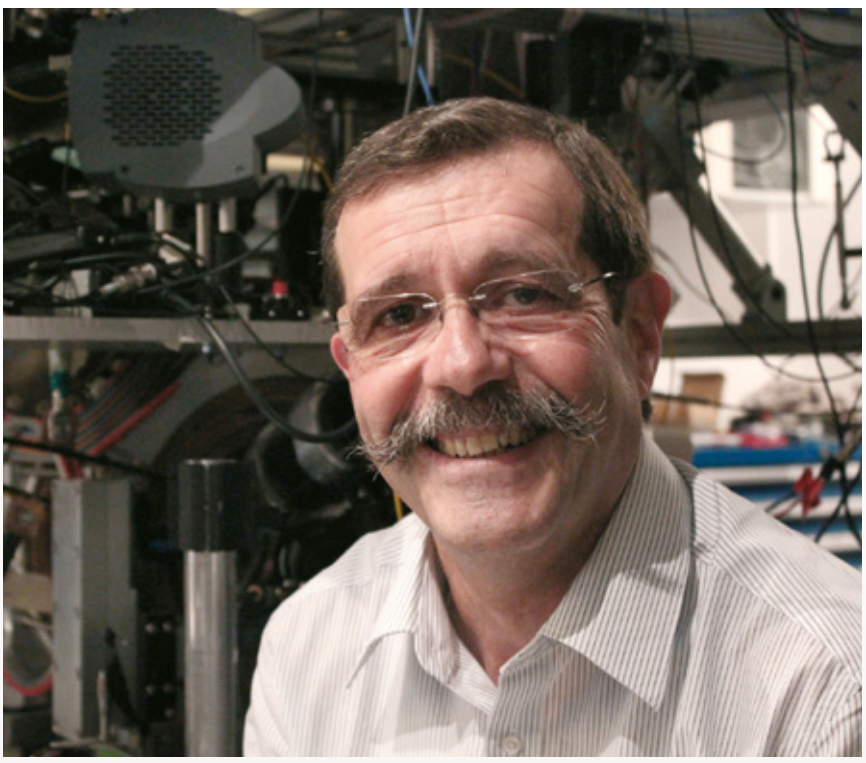
KAVLI COLLOQUIUM

"From the Einstein-Bohr debate to quantum information: the second quantum revolution"

Alain Aspect

Institut d'Optique Graduate School, Université Paris-Saclay

June 29, 2017 will feature a Kavli colloquium by Alain Aspect



In 1935, with co-authors Podolsky and Rosen, Einstein discovered a weird quantum situation, in which particles in a pair are so strongly correlated that Schrödinger called them "entangled". By analyzing that situation, Einstein concluded that the quantum formalism is incomplete. Niels Bohr immediately opposed that conclusion, and the debate lasted until the death of these two giants of physics.

In 1964, John Bell discovered that it is possible to settle the debate experimentally, by testing the now celebrated "Bell's inequalities", and to show directly that the revolutionary concept of entanglement is indeed a reality. A long series of experiments, started in 1972, have produced more and more precise results, in situations closer and closer to the ideal theoretical scheme.

After explaining the debate, and describing some experiments, I will show how this conceptual discussion has prompted the emergence of the new field of quantum information, at the heart of the second quantum revolution.

15.00 h	Pre-programme
	Pre-programme : Student projects at TU Delft - 'on to a Nano-Nuna' - Nuna - iGEM - Hyperloop
15.45 h	Break
16.00 h	Kavli colloquium by Alain Aspect: " From the Einstein-Bohr debate to quantum information: the second quantum revolution "
17.15 h	Drinks & time to meet

Prof.dr. Alain Aspect (1947) studied physics at the Université d'Orsay. After he did his national service, he did teaching for three years in Cameroon. During his PhD (Université d'Orsay) in the early 1980s, he performed the elusive "Bell test experiments" that showed that Einstein, Podolsky and Rosen's reductio ad absurdum of quantum mechanics, namely that it implied 'ghostly action at a distance', did in fact appear to be realised when two particles were separated by an arbitrarily large distance (the so-called EPR paradox). A correlation between their wave functions remained, as they were once part of the same wave-function that was not disturbed before one of the child particles was measured. After his works on Bell's inequalities, he turned toward studies of laser cooling of neutral atoms and is now mostly involved in Bose–Einstein condensates related experiments.
For his fundamental experiments in quantum optics and atomic physics, Alain Aspect was the first to exclude subluminal communication between the measurement stations in experimental demonstrations that quantum mechanics invalidates separable hidden-variable theories, and the first to demonstrate experimentally the wave–particle duality of single photons. He co-invented the technique of velocity-selective coherent population trapping, was the first to compare the Hanbury Brown-Twiss correlations of fermions and bosons under the same conditions, and the first to demonstrate Anderson localization in an ultra-cold atom system. His experiments illuminate fundamental aspects of the quantum-mechanical behaviour of single photons, photon pairs and atoms.
Aspect was deputy director of the French "grande école" SupOptique until 1994. He is a member of the French Academy of Sciences and French Academy of Technologies, and professor at the École Polytechnique. In 2005 he was awarded the gold medal of the Centre national de la recherche scientifique, where he is currently Research Director. The 2010 Wolf Prize in physics was awarded to Aspect, Anton Zeilinger and John Clauser. In 2013 Aspect was awarded both the Danish Niels Bohr International Gold Medal and the UNESCO Niels Bohr Medal. In 2013 he was also awarded the Balzan Prize for Quantum Information Processing and Communication.

KAVLI COLLOQUIUM

Date: June 29, 2017 at 15.00 hours
Location: Faculty of Industrial Design, Joost van der Grintenroom

HOT TOPICS

For Phd students/postdocs.
Register on Casimir website

Date: June 30, 2017 at 12.45 – 14.45 hours
Location: TNW, Building 22, Lecture room E

SELF-INTERVIEW WITH TOENO VAN DER SAR

My name is Toeno van der Sar. In August 2017 I will start as an Assistant Professor in the Quantum Nanoscience Department. I am very happy to become part of such a successful department, and want to thank everyone for the warm welcome and help I have already received!

I am fascinated by magnets (spin waves!), superconductors, and the rich physics of exotic new material systems such as provided by the complex oxides or the Van der Waals materials. My research will focus on exploring these systems by combining nanoscale magnetic-field sensing with electrical transport measurements. One of the first goals will be to develop a magnetic imaging system that uses a single spin in diamond as an atomic-sized sensor, and use it to explore correlated-spin physics on the nanoscale.

I am rather well acquainted with the Delft Physics Department, having done my BSc, MSc, and PhD there! In 2008 I started my PhD in the lab of prof. Ronald Hanson with whom I worked on quantum optics and quantum computing with spins in diamond. I then worked for one year at Philips Research in Eindhoven before moving to the USA for my postdoc. During my postdoc with Amir Yacoby (Harvard & IQC@Waterloo) I started exploring condensed-matter physics, focusing on correlated spin physics in systems ranging from quantum-Hall ferromagnets to room-temperature ferromagnets.

Hobbies? I play guitar & sing, ride my bike a lot, and like to repair things. During my PhD I played in the Delft QT band which was a lot of fun. I am curious how it is doing if it still exists (and if the level of Johnny Cash is proper).
I have two children: Thijm (5) and Roos (2). Together with my wife/their mother (Barbara), we will live in Rotterdam.
The last few years have been quite an adventure. We moved from Rotterdam to Den Bosch, to Cambridge MA, to Waterloo in Ontario (Canada), back to Cambridge MA, and now back to Rotterdam. My son is 5 and this will be his 6th house so he is quite used to moving and actually looks forward to it. We like going into nature, hike, watch birds, and camp. We enjoyed the beautiful nature of the US and Canada and their great camping opportunities.

I look forward to seeing you in Delft!

NEW EMPLOYEES

Name	Date of employment	Title	Lab
Andrea Corna	15/02/17	Postdoc	Vandersypen Lab
Parul Benien	01/03/17	PhD	Cees Dekker lab
Maximilian Ruf	01/03/17	PhD	Hanson Lab
Milad Mehrpoo	01/03/17	PhD	Charbon Lab
Luigi Maduro	15/03/17	PhD	Conesa Boj Lab
Anne-Marije Zwerver	01/04/17	PhD	Vandersypen Lab
Matt Sarsby	01/04/17	Postdoc	Kouwenhoven Lab
Cristian Aparicio	01/04/17	PhD	Stan Brouns lab
Nico Hendrickx	03/04/17	PhD	Veldhorst Lab
Thomas Bauer	15/04/17	Postdoc	Kuipers lab
Marios Kounalakis	01/05/17	PhD	Steele lab
Aron Opheij	01/05/17	Technicus	Kuipers lab
Oscar Tenorio Pearl	01/05/17	Postdoc	Ishihara Lab
David Franke	01/05/17	Postdoc	Veldhorst Lab
Xiao Xu	01/05/17	PhD	Vandersypen Lab
Paveel Aseev	15/05/17	PD	Kouwenhoven Lab
Irina Komen	15/05/17	PhD	Kuipers lab
Yuliia Didan	15/05/17	PhD	Hyun Youk lab
Ana Kalichava	15/05/17	PhD	Cees Dekker lab
Kaley MacKluskey	06/06/17	Postdoc	Nynke Dekker lab
Eugene Kim	01/07/17	Postdoc	Cees Dekker lab
Sonja Schmid	01/09/17	Postdoc	Cees Dekker lab
Theo Marie	01/09/17	PhD	Hyun Youk lab
Diederik Laman Trip	01/09/17	PhD	Hyun Youk lab

2017 Nanosmat Prize for Cees Dekker

Cees Dekker received the Nanosmat Prize 2017. NANOSMAT honours and recognizes international scientists who have shown, during the course of their professional career, outstanding achievements in the fields of Nanoscience and Nanotechnology. The award will be presented at the 12th NANOSMAT conference to be held at the Pierre & Marie University in Paris, France, where Cees will deliver a prize lecture.

Marileen Dogterom Member of the Board of the KNAW

Congratulations to Marileen Dogterom, who, per June 1, will take seat in the Board of the Royal Netherlands Academy of Arts and Sciences. She will succeed Ben Feringa who fulfilled his term as member of this Board.

Two major grants awarded to our Kavli Institute

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The cell is the basis of all organisms and the BaSyC consortium aims to combine biomolecular building blocks to construct an autonomous, self-reproducing cell: a cell that can maintain its own integrity, grow and reproduce. In contrast to many other top-down approaches, the researchers intend to build this synthetic cell from the bottom up. A fundamental understanding of life within a cell will bring huge intellectual, scientific and technological rewards. Expanding the knowledge of life processes opens up unprecedented opportunities for a sustainable world in many aspects of health care, agriculture, materials and energy. The BaSyC project of generating a synthetic cell will also raise philosophical and ethical questions about how society should deal with this new understanding and potential.

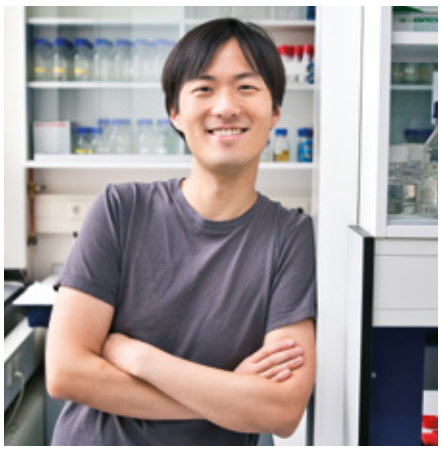
The **Quantum Software** Consortium will develop and implement a quantum internet and software for small quantum computers. The consortium is a collaboration between information scientists, mathematicians and physicists from four universities and two institutes (including QuTech) and is led by Professor Harry Buhrman from the University of Amsterdam. Kavli researchers such as Ronald Hanson play a major role in it as well.

The consortium expects that small-scale quantum computing platforms and quantum networks will soon become available. Such systems allow for calculations that extend far beyond those dreamed for conventional computers. The potential of these future quantum technologies is huge but realizing this potential requires learning what to compute and how to perform such calculations. Quantum software is thus essential for quantum networks and computing. This grant allows the consortium to take big steps in the development and realisation of world-leading software applications. The new algorithms and protocols will be tested on hardware that will become available in Delft and Leiden, and on a quantum network that will be established between Amsterdam, Delft, Leiden and The Hague.

Göran Gustafsson prize for Val Zwiller

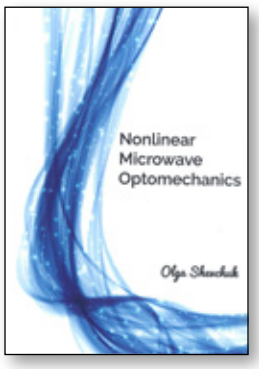
The Göran Gustafsson prize is given every year by the Royal Swedish academy of sciences. This year's prize in physics was given to Prof. Val Zwiller for his innovative research in quantum optics and nanophysics that can lead to deeper understanding of fundamental quantum physics and important applications in future quantum communication'.

International Young Scientist Award for Hyun Youk

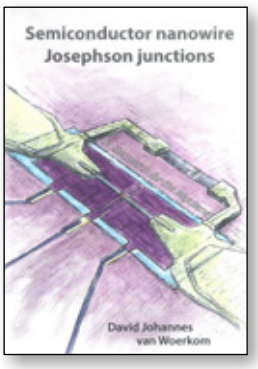


Congratulations to Hyun Youk who was selected as the winner of the 2017 IUPAP C6 Young Scientist Prize! This international prize, given once every three years, is a recognition of Youk's outstanding accomplishments in biological physics research.

RECENT PHD THESES



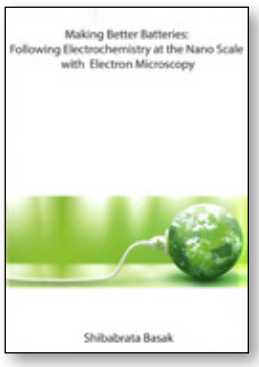
Olga Shevchuk
06 march 2017



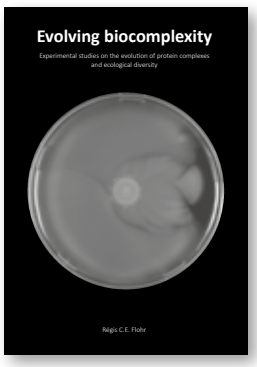
David van Woerkom
10 march 2017

Daniel Szombati
24 march 2017

Nicola Gritti
13 april 2017



Shibabrata Basak
26 april 2017



Régis Flohr
23 june 2017

Professor Amir Yacoby visits Delft as Kavli Chair

As our first Kavli Chair in Delft, professor Amir Yacoby will visit Delft for an extended summer break. As his greatest passion is to solve scientific puzzles he is excited to spend such an extended time in Delft, and we welcome him with great pleasure.

Amir Yacoby currently is a Professor of Physics and Applied Physics at Harvard University. After a bachelor's degree in aeronautical engineering, he followed a master's program focussed on theoretical physics and received his PhD in 1994 at the Weizmann Institute of Science in experimental condensed matter physics. During his postdoc at Bell Labs, he was the first to observe spin-charge separation and back at the Weizmann Institute he developed new techniques for imaging electrical charge.

Professor Yacoby's CV already indicates a broad interest in science, and his research at Harvard allows for loads of interesting research. His research topics include: Spin based quantum computing and metrology using semiconducting quantum dots and color centers in diamond, Topological quantum computing using semiconducting quantum wells and fractional quantum Hall states and interacting electrons in graphene multilayers (from https://www.physics.harvard.edu/people/facpages/yacoby).

Visiting Delft is not just a coincidence. 'Of all places, Delft has the strongest overlap with my research interest', professor Yacoby explains, 'the Kavli chair gives me the opportunity to dive deep and spend time to collaborate with the research groups.' It is not the first time for professor Yacoby to visit Delft: 'I know a lot of people and visited many times, but never had the opportunity to stay for longer times.'

His goal is to not just chat about all different research projects, but engage in a few projects, discuss extensively and really participate. 'I would like to be an active part in the teams, not just sitting in an office,' says professor Yacoby, 'my hope is that interactions and extended discussions will lead to new insights and that even more interesting questions pop up.' For him, science has an individual component, but most definitely an interaction component. 'It is great if a collaboration builds up to something bigger than the sum of the individual parts.'

What it is like to be a Kavli Chair? 'I don't know what it exactly means, but it feels like a great opportunity to spend time in Delft,' laughs professor Yacoby. The directors of our Kavli Institute in Delft, Cees Dekker and Lieven Vandersypen also believe that the Kavli Chair opens doors to great collaborations. Cees: 'This new initiative for our Kavli Institute allows to strengthen the bonds with top scientists in our field of research, such as professor Yacoby, and build up long-term collaborations.'

For the time being, the research group at Harvard will miss the presence of their own professor. 'Well the time difference is actually great,' says professor Yacoby. In this way he can spend the end of the day to interact with his own group. The great coincidence is that professor Yacoby's current postdoc, Toeno van der Sar, will start his own group in the Delft Kavli Institute in, in the Quantum Nanoscience department. 'We basically talk every day now, and will continue doing that in Delft!'

Professor Yacoby is looking forward to stay in Delft, especially as the period has some overlap with the school and university holiday's. 'It is not so easy to detach my family from their own lives', he explains, ' but my wife and four kids will definitely visit me for some time here. He will encourage his kids, who are currently spread from high school to grad school to see Holland properly.

Will professor Yacoby act as a role model for our Delft researchers at many levels? 'my career path is not very traditional, showing that there are many ways to achieve your own goals. I would be delighted to share my experiences…' Scientifically or for career questions; there will be many opportunities for researchers in Delft to talk to professor Yacoby, 'but it should not feel like a full day of doctor's appointments, I would rather discuss science in-depth.' Lieven Vandersypen agrees: 'We are looking forward to stimulating discussions and lectures by Amir and greatly hope that Amir can participate in-depth in some of our current projects in Delft.'

We are very much looking forward to welcome professor Yacoby to Delft, for an inspiring summer, full of great discussions, questions and new insights. Professor Yacoby feels the same: 'I am flattered and excited to take this opportunity, thank you Delft!'

Julia Cramer

Kavli Postdoctoral Fellowships

CALL FOR FELLOWSHIP APPLICATIONS KIND Quantum-Bio Postdoctoral Fellow Program of the Kavli Institute of Nanoscience Delft

In 2017 we started a new high-profile postdoctoral fellowship program for quantum-bio projects at the Kavli Institute of Nanoscience Delft. The program is designed to attract the best and brightest young researchers in nanoscale science to Delft by inviting them to propose their independent research project that involves both quantum and biological nanoscience.

The KIND Postdoctoral Fellow program entails:

- A competitive salary for the KIND Postdoctoral Fellow for 2 years (one step higher than standard postdoc salaries at TU Delft).
- Travel and expendables budget of 5 k€ per year for the KIND Fellow.
- Mentoring by the two involved faculty members of KIND.

The first call will close on September 1, 2017

More information can be found on www.kavli.tudelft.nl

KAVLI DAY 2017

Save the Date

Kavli Day - 7 September '17!

©Henk Thomas

We are thrilled to have Robbert Dijkgraaf as our Invited speaker. Dijkgraaf is currently Director of the Institute of Advanced Studies, Princeton University. In the past, he was president of the Royal Netherlands Academy of Arts and Sciences and co-chair of the InterAcademy Council. He regularly appeared on Dutch television with live physics lectures about infinity, black holes, light, etc.

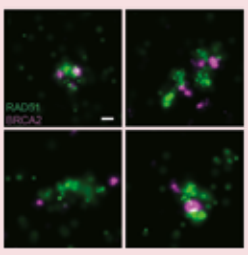
The topic of his talk on 7 September will be **"Information from the structure of the universe to life"**. Don't miss out!

You'll receive an invitation for the Kavli Day in your inbox. The deadline to sign up for this event is due July 15th.

Program Kavli Day September 7 :
10.30h Registration
11.00h Colloquium by Robbert Dijkgraaf
12.15h Lunch
13.00h Depart to Biesbosch by bus
14.00h Activities at Biesbosch
17.00h Diner and borrel at ship 'De Zilvermeeuw"

HIGHLIGHT PAPERS

Architectural plasticity of human BRCA2–RAD51 complexes in DNA break repair

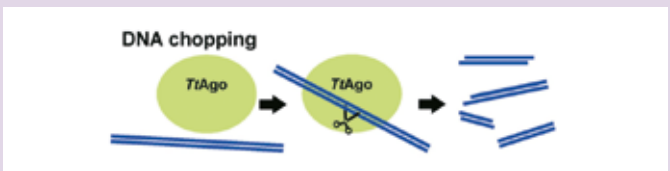


Remarkable flexibility and molecular rearrangements on the huge BRCA2 tumor suppressor protein were revealed by a combination of scanning force and fluorescence microscopy. Although BRCA2 and RAD51 diffuse together in the nucleus they are separated at the site where they work. The first super resolution images of this protein and its partners participating in DNA repair processes in cells bring nuclear foci into focus.

Humberto Sánchez, Maarten W. Paul, Małgorzata Grosbart, Sarah E. van Rossum-Fikkert, Joyce H. G. Lebbink, Roland Kanaar, Adriaan B. Houtsmuller and Claire Wyman
Nucleic Acids Research, 2017, vol. 53 p. 76-82

Autonomous generation and loading of DNA guides by bacterial Argonaute

Prokaryotic Argonaute (pAgo) proteins utilize small DNA guides to mediate host defense. It is unknown how these DNA guides are being generated and loaded onto pAgo. Here we demonstrate that guide-free pAgo can generate small DNA fragments that subsequently are loaded onto pAgo.



Molecular Cell, March 2, 2017

Daan C. Swarts, Malwina Szczepaniak, Gang Sheng, Stanley D. Chandradoss, Yifan Zhu, Elizabeth M. Timmers, Yong Zhang, Hongtu Zhao, Jizhong Lou, Yanli Wang*, Chirlmin Joo*, John van der Oost*

COLUMN

Bad professional advice

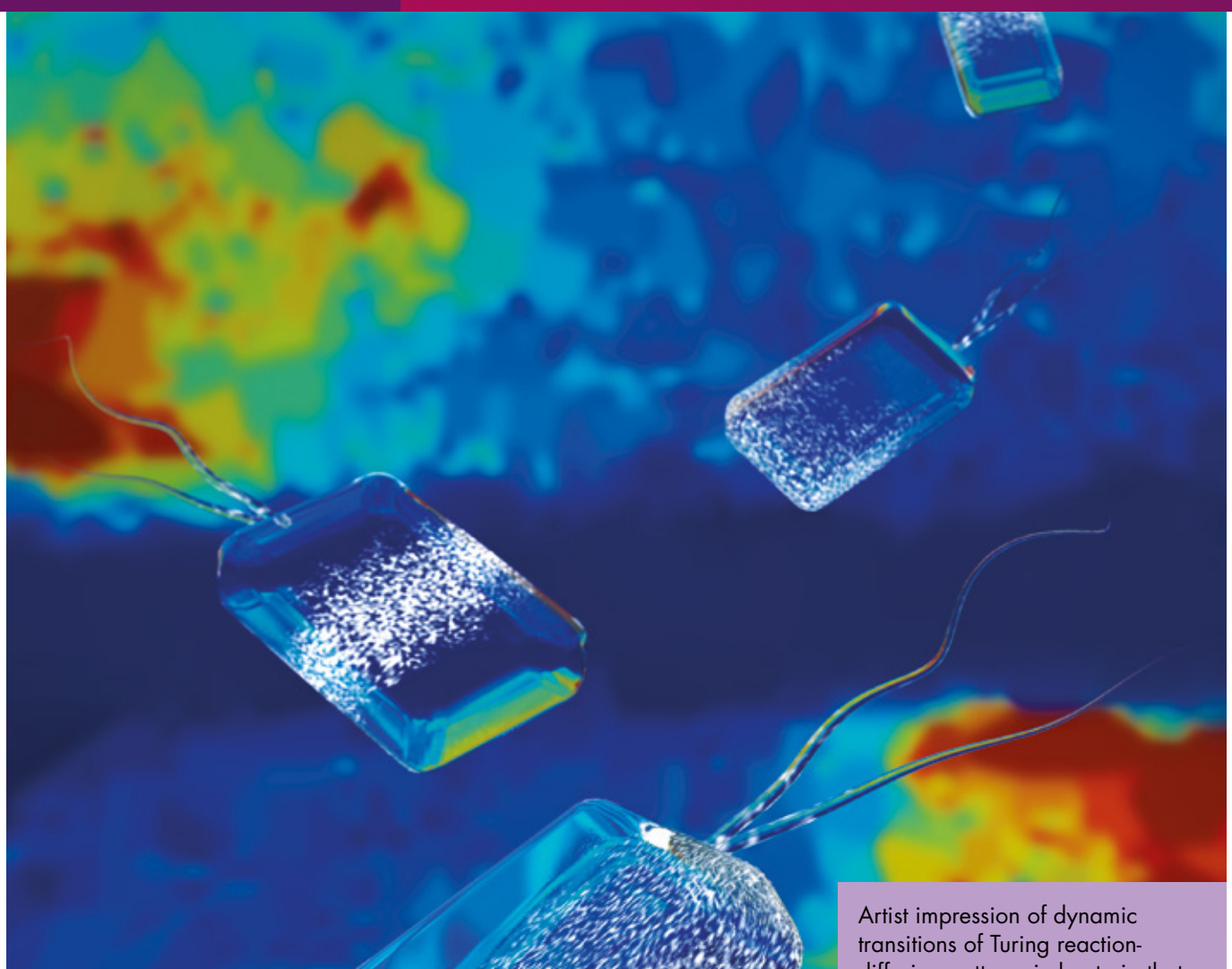
As a child I had a book "Bad advice" that contained nothing but poems suggesting you to do what you should really never do. So here is my bad professional advice (except that I won't risk making poetry):

- Always remember: your job is to do your own research: you are not a charity or a welfare state. Never waste your precious time answering questions of your colleagues or collaborators. Also you shouldn't bother asking them: they are not a charity or a welfare state.
- The best way to start an inter-disciplinary collaboration is to ensure that everyone knows which science is the best and which one is stamp collecting. Also they will never know this until you tell them.
- If your experimental data looks cool, but you don't know what it means, don't bother analysing it. Find a theory paper about the same topic and with similar pictures and cite them. The theorists are happy, reviewers are happy, you are happy!
- If you, like me, are doing theory and don't have experimental data to explain—don't worry. Find an experimental paper about the same topic as yours, find a plot looking similar to yours and tell that your paper explains it. Don't forget to mention that the theory they cite is wrong (they chose it just because the pictures look similar anyway).
- Those, by the way, are the only good reasons to ever read a paper. Nobody is paying you for reading, and also there are much more entertaining things to read (like this newsletter).
- Everybody knows that JPG is the best format for storing your results, as long as you choose merry colors. Because really there is nothing else: spreadsheets are boring and long-winded, and the rest is for total nerds.
- Colors serve another crucial role. Remember I told to find similar-looking plots? Guess what: if the colors match, the plots already look 90% similar!
- This math may seem a bit complicated, but bear with me. If 10% of your job is teaching, you should not be putting more than 10% effort in your teaching. Neat, right?
- If you, like me, don't have a big name, you may wonder how to make sure your results are broadly noticed. Easy: cite your paper on Wikipedia as soon as your paper is out. That way everyone will see it. Also you are now doing outreach, cool!
- Telling your colleagues about your research is stupid. Firstly, it's already on Wikipedia where everybody can read about it. And also, if they are so interested, why didn't they ask you about it yet?

That's all I have for today. Once you get comfortable following this basic bad advice, feel free to come back to me for a master-class. Good luck!

Anton Akhmerov

SCIENCE ART



Artist impression of dynamic transitions of Turing reaction-diffusion patterns in bacteria that are sculptured into different shapes and sizes by nano-fabricated devices. The research unveils how spatial organizations emerge and evolve in the context of intra-cellular heterogeneity and cell boundary growth.
Image credit: Cees Dekker Lab/ conception by Fabai Wu and artistic rendition by Erik Major.

KAVLI DAY

Robbert Dijkgraaf

September, 7, 2017

Princeton University

UPCOMING KAVLI COLLOQUIUM

Amir Yacoby

November 23, 2017

Harvard University

UPCOMING KAVLI COLLOQUIUM

Michael Elowitz

Date to be determined

Caltech

COLOFON

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