



# GGNB *Times*



**GGNB**  
*10 years  
anniversary  
of GGNB*

**RESEARCH**

*Introducing greener  
strategies in natural  
science labs*

**ALUMNI**

*GGNB alumni  
survey*

**GÖTTINGEN**

*Express your art  
in Göttingen*

**ALUMNI**

*Many roads lead to  
New York City*

**GGNB**

*SPOTLIGHT: How to  
organize a  
conference*

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### Photo contest

A PhD can feel like crossing the desert just to deliver a tablespoon of water. However, the journey may teach you more than the destination you reach. Doing a PhD is more than performing experiments in a laboratory. It is about becoming knowledgeable in a research field, going to conferences and maybe organizing one, meeting interesting people, enjoying life in the city of residence, and becoming educated for the future job. The GGNB is there to help you focus on all these aspects of a PhD. In this 3rd issue of the GGNB Times, the editorial board presents you a compilation of articles about the various facets of a PhD, from research to life in Göttingen.

In 2018, the GGNB celebrates its 10th anniversary. We shed light on the beginnings of the GGNB and its milestone achievements in the past decade. This issue's spotlight is conference organisation. The organisers of GOEvol and Neurizons explain how to approach the organisation. In the research section, you can read about the „Green Lab“ initiative and data management. We have encouraging interviews with scientists from Göttingen and GGNB alumni. In an online survey, we asked 130 alumni to tell us about their current jobs, their happiness in life and some insights about their PhD. We have suggestions for you where to spend some time outside of the lab, whether you want to indulge in nature or in culture. Of course, like every year we display the most beautiful pictures of our photo contest.

We hope to inform and entertain you but above all, we want to connect you. There are so many opportunities to shape your PhD journey into an inspiring story. We want to tell you about the opportunities, we want to share the stories and we want you to find more people that join you on your PhD journey and beyond. The GGNB Times has a Facebook page ([facebook.com/ggnbtimes](https://facebook.com/ggnbtimes)) too, to aid in this mission.

Finally, we would like to thank the members of GGNB office, who have been involved in the preparation of this newsletter, especially Kirsten Pöhlker, Steffen Burkhardt and Stefanie Klug for their help in writing and editing the articles. Big thanks also to all the participants of the photo contest for sending in their wonderful images.

The newsletter is released once a year and we are looking for motivated students to join the editorial team for 2019! If you like the newsletter, do not hesitate to jump on board and make the GGNB Times an active part of your PhD journey.

Enjoy reading!

The *GGNB Times* team



Front row (left to right): Sebastian Jähne, Candice Dcosta, Raúl Quiñonez  
Back row: Michael Berger, Ting-Hsuan Lu, Shama Sograte Idrissi, Elisa Buchberger, Arshiya Bhatt © Sebastian Jähne  
(not shown: Zurna Ahmed, Carlos Duque, Arindam Gosh, Georg Hafner, Daryna Tarasenko)

# Welcome

# The History of the GGNB

Elisa Buchberger & Georg Hafner

2018 marks the 10th anniversary of the first use of the Large Hadron Collider. This machine is the incarnation of modern day scientific excellence. It is a gigantic project that demands the collaborative effort of many people and institutions and is proof that science requires a vast, supportive infrastructure to unleash the full potential of clever researchers. Similarly, when we PhD students join our lab, we require the support of many people to pursue our scientific questions: our supervisor, technicians, collaborators and many more. 2018 marks the 10th anniversary of the GGNB graduate school and this is a great opportunity to remind us all that the GGNB is an essential part of this supportive infrastructure.

On occasion of the GGNB birthday we would like to illuminate the beginnings of the graduate school. In 2007, the University of Göttingen submitted grant proposals for each funding line in the Excellence Initiative: one for the institutional strategy of the University, one for the cluster of excellence “Nanoscale Microscopy and Molecular Physiology of the Brain“, and one for a graduate school with a focus on molecular biosciences, biophysics and neurosciences. For the proposal of the latter one, the two IMPRS

programs for Neurosciences and Molecular Biology served as role models. They had existed in Göttingen for seven years already and had gained an international reputation as high-quality programs. The aim was to extend the services of these programs to more doctoral students by scaling up the models they provided. Several institutions were brought together: the University of Göttingen, the University Medical Center, three Max Planck Institutes and the German Primate Center, reflecting the Göttingen Campus strategy to fully integrate also local, non-university institutions into the interdisciplinary, campus-wide doctoral education.

The grant was submitted to the DFG in March 2007. In summer 2007, the good news was announced: Göttingen University was successful in all three funding lines of the Excellence Initiative. The Göttingen Graduate School for Neurosciences and Molecular Biosciences (GGNB) was awarded funding for five years. At that time, twelve programs (see graphic) were united under the umbrella of the GGNB. Reinhard Jahn became the spokesperson and remained in this position until 2016 when Ralf Ficner (and Patrick Cramer as deputy) took over. Steffen Burkhardt became the managing director of the GGNB, Michael Hörner established the new GGNB training lab in electrophysiology, which he is heading since then. Kai Tittmann was appointed as a new professor for the other newly established GGNB

training lab and technical service platform for bioanalytics. As a major logistic and administrative support, the GGNB Office was set up, headed by Kirsten Pöhlker. The aim was to provide a One Stop Service Unit for application and admission, advise on study-related issues and help in all administrative steps to obtain a doctoral degree.

In 2012, the proposal for a second funding phase was successful. It included various new elements for further development of the structures and measures of the GGNB, now extending into the early postdoc phase. A very important and well-perceived service was launched in November 2012, when Katrin Wodzicki established the GGNB Career Service. It had and still has the mission to inform and advise late-stage PhD students and postdocs in the natural sciences about career options in- or outside of academia. For this purpose, it offers diverse workshops, talks and counselling sessions for orientation in the job market. At the beginning of 2018, Stefanie Klug followed Katrin Wodzicki as the Career Service coordinator, now integrated in the newly structured GAUSS Office.

The GGNB has established a framework that provides excellent conditions for doctoral students. Students have an upper limit of maximally four years to finish their thesis. On the basis of regular progress reports they discuss their work with their thesis advisory committee. For many years, individual fel-

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lowships (excellence stipends) were granted on a competitive basis. Junior group stipends, bridging funds, travel grants and other forms of financial support ensure that students are not totally dependent on the money from their own lab. Admission of new PhD students to the graduate school and the individual doctoral programs is coordinated by the GGNB Office and students can apply once their supervisor is part of the GGNB. To give students access to education outside the expertise of their own research group, GGNB offers a wide range of methods and skill courses.

Another major ambition of GGNB is to strengthen the network among the many graduate students. Annual retreats allow for social and scientific interactions within the individual programs. The GGNB Science Days as well as methods and skills courses bring together students regardless of program affiliation to foster scientific exchange. The GGNB Summer Games, excursions and Culture Nights provide opportunities to get to know each other on non-scientific grounds. Additionally, student-organised conferences give students the chance to get in contact with scientists from all over the world. In the past 10 years GGNB has grown in number of students, programs and achievements. Over 1,000 students have graduated so far (see Alumni report on p. 29). Currently, over 500 students from 82 nationalities are enrolled (see GGNB in numbers, p.15). Four new programs have joined GGNB since 2008 (see graphic), with Molecular Medicine being the most recent one. At the end of 2018, the Excellence Initiative funding for GGNB will come to an end after two successful extensions in 2012 and 2017. This does not mark the end of GGNB but necessitates a transformation. Thanks to the ongoing financial support from the founding institutions and the affiliation to GAUSS, GGNB will continue to fulfill its mission of providing excellent conditions for doctoral students under the new name Göttingen Graduate Center for Neurosciences, Biophysics, and Molecular Biosciences

The 10th Anniversary of GGNB will be celebrated on 16th November 2018 with the fifth Science Day that the Scientific Advisory Board will attend, too. We will have poster sessions, a science slam, lectures and a reception. The keynote speaker will be the renowned neuroscientist Botond Roska from Basel, Switzerland.

**SS 2007**  
GGNB is awarded funding in the German Excellence Initiative

**NOVEMBER 2007**  
1<sup>st</sup> funding period of GGNB starts

**JANUARY 2008**  
GGNB Office starts work

**NOVEMBER 2008**  
GGNB Opening

**SS 2009**  
NEUREST expires (due to end of third party funding)

**SS 2010**  
GRK 521 expires (due to end of third party funding)

**SS 2011**  
New program Microbiology and Biochemistry

**SS 2012**  
New program EIDIS

**SS 2016**  
New program IRTG 2172 - PRoTECT

**SS 2017**  
New program IMPRS Genome Science

**WS 2017/18**  
New program Molecular Medicine

# The New GGNB Representatives

Katharina Vollheyde & Jason Khadka

## Katharina Vollheyde

Hello, I am Katharina, 25 years old and I just started my second year as a PhD student in the Department of Plant Biochemistry. Since the beginning of this year, I am one of the new student representatives in the GGNB Board.

The GGNB Board is the administrative organ of our graduate school and takes all pertinent decisions affecting the GGNB. Since a lot of these decisions have an influence on our studies in GGNB, it is very important to have a person who deputizes for the student's interest and who evaluates all decisions from a student's point of view.

I personally like to take responsibility and be in charge of orga-

nisational tasks. Up to now, this included tasks like planning the department's annual events. However, as a student representative, I am more than happy and motivated to take over more professional responsibilities as well. I am curious to learn more about the administrative organisation of operational workflows at the university in general and the GGNB in particular. When taking over a new post, it is crucial for me to become acquainted with my new tasks in detail, since it is only possible to advocate confidently for concerns and decisions when you have a profound background knowledge.

During my time as a student representative, I would like to function as a mediator between the Board

and the students, stating concerns, expressing wishes and lodging complaints to the Board.



Katharina Vollheyde © Jasmin Gömann



Jason Khadka © Joshan Chaudhary

## Jason Khadka

I am Jason Khadka and I came to Göttingen at the end of 2015 for my PhD in Physics at the Max Planck Institute for Dyna-

mics and Self-Organisation. I am excited and honoured to be one of the student representatives for the GGNB Board. In my project, I am working on understanding the role of mechanics in tissue growth of plant using computational models. During these past years in Göttingen, the GGNB has been a tremendous support to me and it has also been a place to meet other students sharing similar interests. Now, as a student representative, I have an opportunity for helping to voice the views of the student body to the Board of GGNB. In this position, I would like to work towards changes in the regulations and rules, such as they are in fact beneficial to the students and therefore their perspectives are considered. Furthermore,

being a student representative also carries the responsibility of bringing forward the hardships of students to the rest of the Board, and, if possible, suggest new changes to the program regulations to relieve students. In the following year, I would like to work towards a better support on career service for students, and especially make the existing support more visible. With the integration of the GGNB career service to GAUSS, the responsibility of the career service has expanded and I would like to use this opportunity to have more diverse workshops and mentorship programs on support for students heading out to all the directions.

# The Retreats of the GGNB Programs

Compiled by Elisa Buchberger

## Joint retreat of the Molecular Biology of Cells and Biomolecules programs (contributed by Jimena Davila)

Last year's joint retreat of the programs Molecular Biology of Cells and Biomolecules took place at the end of summer (from August 21st to 22nd) and since we had such a good experience the year before, we again celebrated it at the Landhotel am Rothenberg in Uslar. We organised student talks in which the PhD candidates presented their projects followed by a short round of questions. As every year, we invited professors as well as guests from outside academia, to give short talks about their current position and to tell us about how they got their current position. These career sessions aim to provide the students

with a broad landscape of options after their PhD. For this retreat we invited Dr. Karin Kühnel (Editor at Nature Communications) and Dr. Sebastian Petri (Project Manager at Seigfried), together with Prof. Bohnsack. To generate a team spirit among the PhD students we organised different team building activities. We had our try at the hotel owned high rope course and played games like "Boßeln". We finished the day and the retreat with a barbecue and a bonfire.

## IMPRS Neuroscience Program (contributed by Alexander Dieter)

The annual retreat of the IMPRS for Neuroscience was held from 20th to 22nd of November 2017 in Bad Salzdetfurth, close to Hildesheim. Besides scientific talks covering topics from molecular neuroscience over synaptic research and sensory systems up to clinical neuroscience, students discussed the progress of their PhD work during two very interactive poster sessions. Despite the comprehensive scientific component of the retreat, there was still time for more relaxing discussions at the hotel's bowling lane and to enjoy some culture during a costumed city tour in the historical downtown of Hildesheim.



The Students of the Molecular Biology of Cells and Biomolecules programs © Jimena Davila

## IMPRS for Genome Science (contributed by Wanwan Ge)

Our very first PhD retreat was held from 14th to 16th of June at the Harnack-Haus in Berlin. We started off on the first day with some team building activities, like a visit to an Escape Room or a tour through the Botanical Garden in order to get to know each other better. This was followed by a joint scientific day together with the IMPRS graduate school for Computational Biology and Scientific Computing based in Berlin. We then had the chance to listen to the talks of two invited speakers, one coming from academia and one from industry. The retreat ended with soft skill courses, aiming at providing us with the necessary tool-kit for our further PhD studies.



Retreat of the IMPRS Neuroscience program © Katharina Gramberg



Retreat of the IMPRS Genome Science program © Ting-Hsuan Lu



The Students of the Molecular Biology Program enjoying their boat tour © Steffen Burkhardt

### **IMPRS for Molecular Biology (contributed by Franziska Kretzschmar)**

This year's MolBio retreat took 40 PhD students to Etelsen castle on the outskirts of Bremen. The first two days were packed with student talks, providing a refreshing mixture of early stage PhD students introducing their projects and late stage PhD students presenting their results. The poster session offered then a great chance to discuss the projects more interactively. A welcomed change were the walking tour through the historic city center of Bremen and visit to the modern art museum Weserburg Bremen. The non-scientific program ended with a river and harbor boat tour. During the dinner on day two, we were joined by alumni of the program, representing both worlds, academia as well as industry. We learned about challenges, decision making and new responsibilities in both areas and had the chance to ask personal and more specific questions during several rounds of "Alumni Speed

Dating". In summary, this year's Molbio retreat brought together students from different stages in their PhD to exchange ideas, scientifically and beyond, and to connect with current and former students. The Alumni Career Day was a new student's favorite and shall be continued during the next years.

### **Genes and Development Program (contributed by Felix Kaufholz and Dominik Botermann)**

Our retreat took us to the 'Park Hotel Soltau' in Soltau. Besides the 15 students of the program, Prof. Bucher (Evol. Dev. Genetics, Uni-Goe), Prof. Eichele (Genes and Behaviour, MPI-BPC) and Dr. Posnien (Developmental Biology, Uni-Goe) joined us for two days full of talks, discussions, and poster presentations.

After getting to know each other during the three-hour long train ride, the scientific program started with student talks. A Zeiss represen-

tative joined us for a career session, the last official appointment of the first day. A very vivid and insightful discussion followed, focusing on how to balance a possible career in science with family and private life. It was especially interesting since the opinions were quite diverse and not necessarily what one might have expected! The evening was spent having dinner before going bowling and we finished the day relaxing, having drinks and enjoying ourselves. The second day started early and we again had the pleasure of listening to five more student talks. We officially ended the retreat with a 30 min poster session, learning more about the projects of the other PhD students and the voting for new student representatives.

# Third Infinity Conference 2017

Jason Khadka

Students of PBCS hosted the 3rd edition of the Third Infinity Conference at the Max Planck Campus. The conference hosted eight speakers from wide-ranging fields of research and more than 100 participants. The topics discussed were as diverse as the research in the PBCS, diving into the questions of Morphogenesis, Spatial-temporal Complex Networks, Spectroscopy and many more. Prof. Reinhard Jahn from the Max Planck Institute for Biophysical Chemistry gave an inspirational lecture on his work about vesicle docking and membrane fusion, delivering the keynote address to the conference. The highlights of the conference were the 22 talks and the 55 posters presented by stu-



Conference picture of the Third Infinity Conference organised by students from the PBCS program © Irene Böttcher-Gajewski

dents. This absorbing exchange of science was topped up by the public voting for the best student talk and the poster prize, which were awarded to Martin Vögele from the Max Planck Institute for Biophysics

and Jonas Schäfer from the University of Göttingen, respectively. The next edition of the conference will be held in 2019, while this year the students of PBCS will enjoy a relaxing retreat with their colleagues

## The SPIRIT Summer Schools - an Interview with Prof. Gregor Bucher

Elisa Buchberger

### 1. Can you tell us a bit about what the Göttingen SPIRIT Summer Schools are?

In the past, there was a deep divide between scientists interested in zoological questions (studying many species and comparing differences) and scientists working on the genetic bases of life (working on a few highly developed model organisms like fly, nematode, zebrafish and mouse). Recently, a number of new techniques have opened the possibility to study the genetic underpinnings of biological

processes in many more than the few well known model organisms: Next Generation Sequencing allows determining the genes of any model organism, RNAi allows studying gene function without the need of elaborate genetics, universal transposon systems allow making transgenic lines in many model organisms and CRISPR/Cas9 genome editing opens a plethora of new avenues. Our summer school aims to foster the use of these techniques in the field of Zoology by sharing our experience in their development and application in several

organisms. The university called for proposals for Summer Schools and offered generous funding. A group of four scientists was involved in organizing different aspects of the school (Dr. Nico Posnien, Prof. Daniel Jackson, Prof. Ernst Wimmer and me as the main organiser). We first offered the Summer School in 2017 and plan to organise it every two years. Unfortunately, funding is not yet secured.

### 2. What motivates you personally to organise and be part of the Summer School?

On one hand, I see the potential of applying these techniques in Zoology, but I also see that many Zoologists hesitate to go for it because the approaches are so new to them. Therefore, I thought that such a Summer School would help Zoologists to apply these techniques for their own research questions. On the other hand, I had previously joined meetings where a plethora of different biological and zoological questions were discussed in terms of gene function, which gave further inspiration.

### **3. How long does the organisation of a one-week Summer School take and what are the most important steps?**

I would say, one year before, you have to come up with a concept and find people that are willing to join. A difficult task is to get the funding for such a school. This has to be taken care of quite early because you need to know how many speakers you are able to invite. In our case, the first round of the summer school was funded by the university and that helped a lot! The next big step is to invite speakers; Don't wait too long because schedules of known researchers in the field usually fill quite rapidly. Some good names are needed in order to advertise the school! Also, don't forget to think about reservations for seminar rooms, hotels and so on.

Approximately, half a year before we designed the homepage and started advertising. Two to three months before the school started, we had to specify a detailed schedule and to design the experiments, distribute the tasks between us and the helpers and select the appli-

cants. The two weeks before are almost completely blocked with preparations.

### **4. Where do the students come from and how are you addressing international participants?**

We aimed at more than a third of the participants being from abroad or internationals working in Germany. Students came mainly from Europe, but we also hosted participants from Asia and America.

### **5. What can students specifically learn during this week?**

In lectures, we taught the basics of the techniques with a clear focus on application. Some key experiments or analyses were done in the wet lab or at the computer in order to get first hand experience. We asked the students to make a plan for their specific PhD project and present their projects during a poster session which was followed by an in-depth discussion. This was interesting for both, the students and us since it was amazing to see how scientists would give diverse feedback from other angles depending on their own scientific background. Finally, we reserved extra slots for discussing projects and ideas depending on the need of the student. The overall idea was that the participants left Göttingen with a detailed plan and new ideas for their own research projects.

### **6. What did you gain from organizing the Summer School?**

I profited from the discussions with the invited speakers and I found it interesting to talk about



Caption © figure/picture author

the different projects of the participants. But there are some other points to consider. People in the field will remember your name as an organiser and might have positive expectations with respect to your expertise. Additionally, we hope to attract PhD students or young group leaders and it definitely helps, if Göttingen is positioned as a location where you can learn such techniques. In any case, it is good for the University's reputation.

### **7. Why would you recommend PhD students to attend Summer Schools, apart from the possibility to learn new skills?**

Getting feedback from different scientists will make your project better. Everyone has a specific field of expertise and no one knows everything (not even your direct supervisor – believe me, I am one). All these discussions will broaden your horizon and hopefully bring new ideas. Finally, you get to know people who are experts in certain techniques or analyses and you might want to contact them in case you have questions.

# SPOTLIGHT: How to Organise a Conference

## How to organise meetings OR...how to mould your own pot

Max Farnworth

As young scientists we are supposed to create our own network and research environment. If you imagine your scientific surroundings as a big pot, you should mould it yourself, perfectly suited for your future needs and career choices. But how can we make it our own, if we are restricted by a set of specific meetings, by guest lecturers that are invited by other people, and by the interests of our colleagues?

There is a solution: Organise your own meeting, invite people yourself and hence, be more active in building up your network. Think about it: You can invite the scientists that YOU are most interested in, you can organise meetings for a topic that you think is underrepresented. You can shape a meeting which is different than all the bigger ones, with longer discussion times, fewer people, thus more personal chats, maybe a party, or even a live band! Sounds like a hard and difficult task? Maybe moulding your own pot is a little less difficult than you think:

Here are three different levels you could get active in:

### 1. Invite a speaker to a colloquium

If you have a specific person in mind that would

fit the colloquium bill, invite him/her. Don't rely on your department to neatly invite all those researchers interesting for you. You would be surprised in how happy people are to come, if the person inviting is someone who has slightly more time to engage and care than the normal professors (no offense PIs).

### 2. Organise a symposium

The German Neuroscience Society meeting is a really big meeting. Still, I felt that the evolutionary side of neurobiology was desperately underrepresented. Luckily Dr. Nico Posnien offered to organise a symposium with me as he shared a similar impression. Being part of a bigger meeting, a lot of things are organised for you, maybe also the financial support. So, this is a very good opportunity to get your organising muscles into the gym and mould your network to your needs. Maybe you can even influence your field on a small scale?! Check out the society closest to your interest. I bet they will have meetings and a call for symposia. Team up with another person and start.

### 3. Organise a conference:

Having been to some of the big society conferences, I really enjoyed the idea of small personal meetings. Setting up a whole meeting is quite

a big task, so a team is the key. The GOEvol network is such a group and it was thus a perfect opportunity to join (contact details see below!). We are a group of roughly 10 people with the aim to increase the interaction of scientists interested in evolutionary biology. We regularly organise meetings about different topics surrounding evolutionary biology.

Let me give you an impression of the last meeting: The topic was "Networks in Biology". We invited physicists, mathematicians and biologists from various fields such as animal social networks to a concept for distributed information. We hosted about 100 participants in total. We had a live band, burgers and of course, beer. We had time to discuss, time to listen and time to enjoy science in a relaxed atmosphere. That does sound great, doesn't it? And I bet this year's meeting "#sensation @GOEEvolution 2018" on September 27th to 28th will be equally impactful.

After all, what does it need to organise a proper meeting?

- Define a specific, but at the same time multi-accessible topic:

You need an overarching theme, where the subtopics can be appro-

ached by different methodological ways or different biological aspects.

- Find a group of co-organisers:

The number of people is not as important as common interest and dedication to all tasks. A higher number of people is beneficial for the creative input and helps to alleviate the individual work load. However, the more people contribute, the more difficult it becomes to organise the organisers, a point that is also discussed in more detail in the following article.

- Finding financial support (also applies to point 2):

Don't be too afraid finding financial support. There are quite a lot of agencies who are happy to help if the concept is right and if they see that there is a detailed plan.

It is a big advantage if the speakers agreed to come before you send off the application. Be honest and open to them and state that you are applying for financial support, but if that doesn't work out, could they support themselves? Most of them actually can and would be willing to! Here are a few ideas whom to approach: A lot of societies themselves would be happy to help for a meeting that suits topic-wise. Similarly, journals are sources to approach. We got funding for example by the Company of Biologists. Also, companies in and around Göttingen could be approached for smaller amounts of money in exchange of advertisement, e.g. SeqLab, KWS, etc. Specific for Göttingen and highly recommended are the Klaus-Inhülsen-Zustiftung and the Unibund Göttingen.

Wherever you want to start, be brave. You will be surprised by how many invited speakers will actually say Yes! Getting the opportunity in such ways definitely added to my organisational skill set and getting to know the ground work underlying meetings was very interesting. Of course, organisation requires work but I was rewarded with many opportunities to talk to amazing scientists. So, if you are in a similar situation like me – interested in a field that is maybe underrepresented – get active yourself and mould your own pot!

Please go to our GOEvol website, our Facebook site or our Twitter account for more information.

URL: <http://www.goevol.uni-goettingen.de/>

# Inside Neurizons: organising the organisation

Ronja Markworth & Linda Olsthoorn

This year, the conference Neurizons was organised for the eighth time by students of the IMPRS Neuroscience program carrying the slogan: *Fire. Wire. Inspire.* These student-organised conferences are common in graduate programs (Neurizons, Horizons, Third Infinity and many more in Göttingen alone). While it has become a tradition for some programs to organise a conference, others may still be hesitant to take on the task. As pointed out in the previous article it has so many advantages to organise a conference and shape it according to your own interests. We would

like to share some of our experiences at preparing the Neurizons meeting and give you some personal advice how to establish a structure for the organisation of successive conferences.

First things first. Have you ever considered what kind of group dynamics might be most suitable to organise a conference? Horizons, for example, uses a relatively defined hierarchical structure. There is one head of the whole organiser team and separate heads assigned to subgroups that handle specific tasks. Within the core team of Neurizons,

we initially decided not to have such a strict hierarchy but rather assemble focus groups for different organisational aspects. Looking back, this was a naive approach and a stronger hierarchy would have been more efficient. Accordingly, we recommend having some chain of command in place, not as much for major decision-making as for smoothing out communication. If you have a team of about 15 organisers with equal authority, communication is the key.

The topic of effective communication brings us to our

second point: which medium of communication to use within your team. We decided to use Facebook because it is inherently designed to maintain contact between large groups of people. But there were some clear pitfalls to this approach. Obviously, it was difficult to keep anyone without Facebook in the loop and you cannot blame them, given all the valid reasons (e.g. Cambridge Analytica) not to have an account. Furthermore, it promoted a lack of overview. We had one general Facebook group for all organisers and one group for each of the six subgroups to discuss either matters of general concern or group-specific topics, respectively. The subgrouping prevented overcrowding of information on the general group but the different subgroups did not know what the other ones were working on, for example if something has been overlooked or if the same work is being executed by two groups independently. In the light of this, considering other communication channels might be worth it. A hot alternative would be apps specifically designed for teamwork, such as Slack, Hip-Chat, Twist, Microsoft Team... There are many such tools out there, so take some time to check them out. The main drawback in this instance would be the need for all team members to keep an eye on yet another media besides all the ones they are already using.

Another crucial insight that we want to draw your attention to is documentation. Especially if the conference should take place more than once, it can be tremendously useful for the next

generation to build on the structure and experience from previous meetings. This includes overview of potential costs, pre-established agreements with institutions and companies involved, and the best people to contact for certain things. Besides sharing a Google drive to keep track of all documents, we also strongly recommend you make and/or maintain 'How-To' documents. These files should contain instructions, contact information and preferably a timeline that new organisers can follow, including all of the valuable lessons gathered by past organisers the hard way. From experience, we can tell you that if something like that does not exist, a lot of time is wasted on problems that could have been easily avoided.

So far, it may have sounded like organising a conference is all work and no fun. But we assure you, there is more to it. In the process you get to know the other students in your program much better. All the challenges you will face will unite you and you will learn a lot of new things about each other. Also, by interacting with great scientists at a more personal level, you will expand your network to interesting people from various fields, be it science, marketing, management or

public relations. Above all, the greatest advantage of being in the organising team is the chance to invite whoever YOU find interesting.

One last thought: We are aware that every graduate program is an individual entity. But wouldn't it make sense to have more communication between the different programs when it comes down to the organisation of conferences? Organising Neurizons has been a wonderful experience - but surprisingly isolated for a group of well-connected PhD candidates. We all run into similar problems and collaboration could be the key to avoid them. An exchange between organisers of conferences from different programs would have benefitted us and we recommend its implementation as a yearly routine to not only make life for future students easier, but more importantly to improve the quality of conferences we offer in Göttingen.

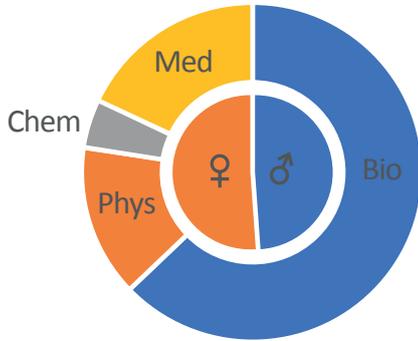
Overall, organising Neurizons feels like contributing to a painting without ever seeing the picture as a whole, thus not knowing up until the conference is over whether you did a good job. To that end, we hope that we have fired, wired and inspired some of you in one way or another.



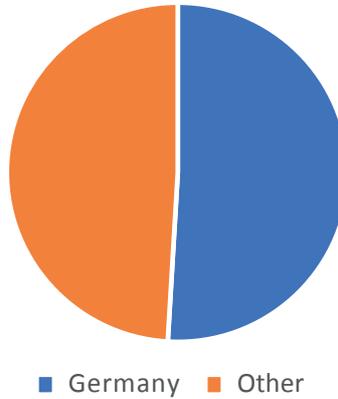
Neurizons 2018, organisers and speakers © Irene Böttcher-Gajewski

# The GGNB in Numbers

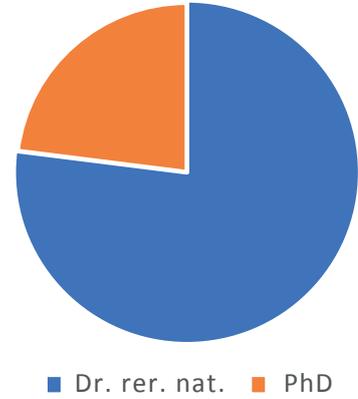
**Faculty Affiliation**  
(in total 532 students enrolled)



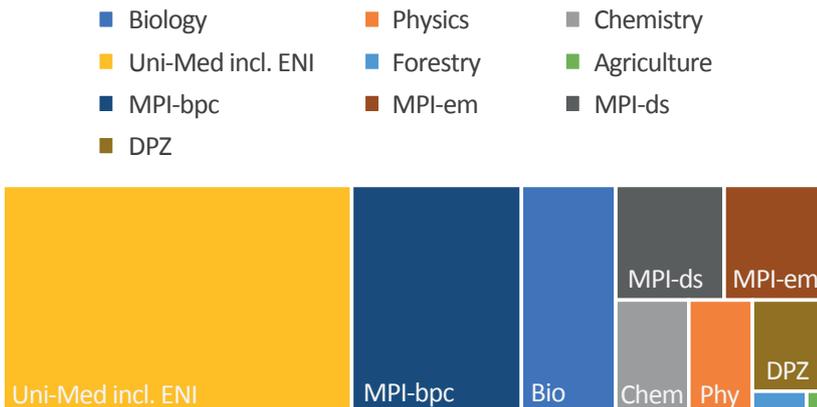
**Country of Origin**  
(currently over 50 different countries)



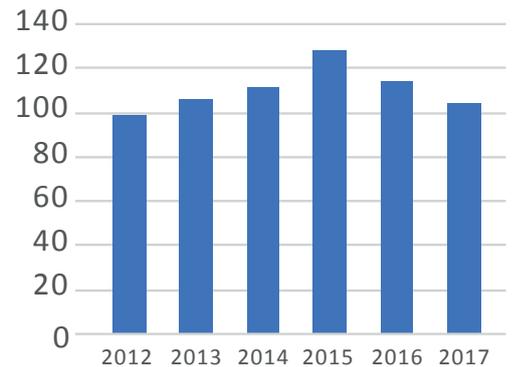
**Dr. rer. nat. vs PhD**  
(degrees awarded: 1002)



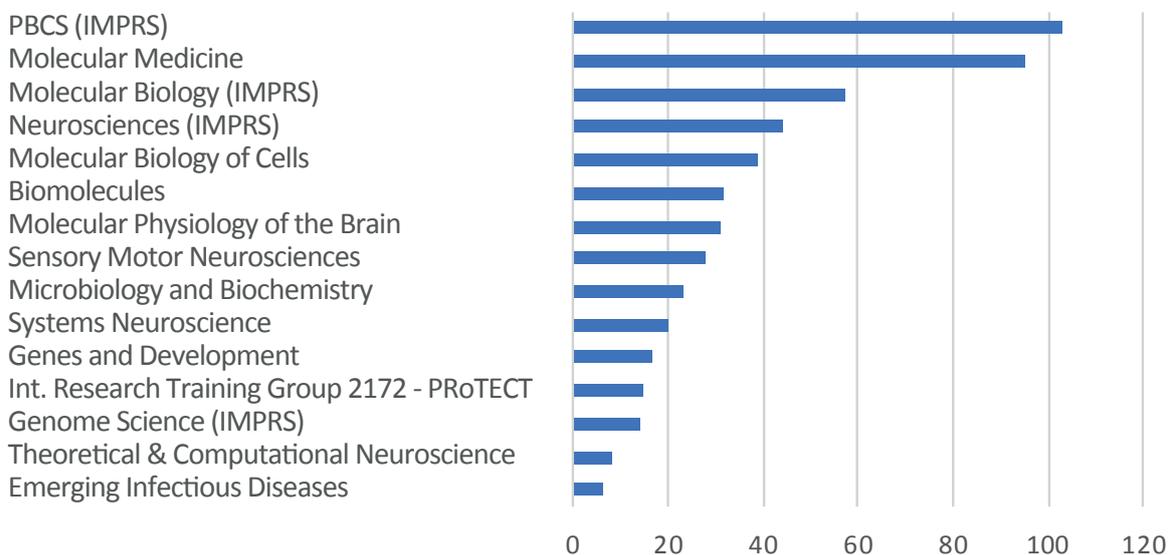
**Institutional Affiliation of Hosting Lab**



**Number of PhD Thesis Completed by Year**



**Program Affiliation of Current PhD Students**



# Introducing greener strategies in natural science labs: an interview with Dr. Kerstin Hermuth-Kleinschmidt

Sinem M Sertel



© Dr. Kerstin Hermuth-Kleinschmidt

We are becoming more and more aware of our carbon footprint. Increasing awareness on climate change is introducing “greener” life styles. For example, every year you can save up to 350 kg CO<sub>2</sub> by turning off your PC when leaving the office, or 260 kg CO<sub>2</sub> by cycling to work according to the Eco-friendly commission of the EU. These small actions in every-day life have a bigger impact than you might think. Keep going! But what about the carbon footprint of your scientific work?

Every day we are producing a lot of plastic waste and consuming enormous amounts of electricity with our latest technology devices.

Keeping this in mind, some of us are trying not to print ar-

ticles and use e-notebooks in order to avoid paper waste. Some of us are making efforts to use more glassware rather than plastic material, and some of us are collecting plastic and paper waste in the lab for recycling. These small actions do help, but are there even better measures to take for Mother Earth? At this point, Dr. Kerstin Hermuth-Kleinschmidt can help us to introduce greener strategies into natural science labs. She founded the “NIUB-Nachhaltigkeitsberatung” and works as a freelancer to increase awareness for sustainability in labs in Germany.

## **Tell us more about yourself and how you started to recognize waste and consumption problems in the labs!**

First of all, I have to admit that during my PhD there was very little awareness about sustainable practices in the lab. The replacement of methods using radioactive components was in focus, but the question concerning green labs came up much later. It started with my parental leave. When I was thinking about what to do next, I decided to find a job which is oriented more towards ecology and sustainability. While searching, I came across this huge resource consumption and waste production in natural science labs. I could not believe that a fume hood is using as much

energy as a single-family house. By pursuing a course on sustainability and environmental management, I obtained the necessary background. Now I am providing information about the best practice, ideas and alternative methods to labs in order to help them work more sustainably. I am also communicating with universities and companies to spread the idea of “green lab”.

## **Can you tell us more about NIUB and its actions in Europe and similar movements around the world?**

NIUB is mainly focused on Germany. I am giving talks and workshops as well as publishing articles about sustainable methods and processes in the lab. I am also a member of EGNATON (European society for sustainable laboratory technologies). This society brings together architects and lab planners to design and build sustainable laboratories for a greener lab environment. It is

Research

Research

also developing a certification standard, EGNATON-CERT, for sustainable instruments like freezers, autoclaves and fume hoods. This label awards ecologic and sustainable instruments.

There is also another project in Germany regarding greener strategies: “iGEM goes green” was initiated last year by a group of students at the TU Dresden. They prepared a “Go Green Guide” which is full of ideas to establish a sustainable lab and a tool to measure your personal CO<sub>2</sub>-footprint in the lab.

And, last but not the least, I would like to mention the US non-profit organisation “My green lab” ([www.mygreenlab.org](http://www.mygreenlab.org)). It shows a lot of information on their website. They are offering lab assessment to universities in the US and they have just developed the „ACT Label“ for more ecologic consumables, chemicals and instruments. My green lab also initiated the Freezer Challenge, an international competition to promote best practices in cold storage management.

### **What would you recommend researchers to avoid waste and have greener labs?**

First and foremost, you have to be aware of your personal impact. How much energy and water are you consuming in your daily work? How much waste are you producing? A research group estimated in 2015 that the bio scientific research is responsible for 1.8% of the total global plastic production. This equals to 5.5 million tons of plastic waste that are produced in the labs worldwide.

### **What can we do about it?**

- Think of alternatives: try to use glass ware instead of plastics whenever possible. Glass petri dishes could be a nice starting point to reduce plastic waste.

- Think about packaging waste: usually DNA prep kits come with a lot of plastic packaging, but there are other manufacturers that use less and recyclable packaging such as NEB. There are also several suppliers who are offering a “take back” program such as Kimtech, which recycles gloves.

- Think about the chemicals you are using in the lab: Does it contain toxic components and if so, are there non-toxic alternatives? Everybody knows alternatives to ethidium bromide but there are other examples. If you’re doing HPLC analysis, acetonitrile is the best solvent; however, it’s toxic. If you look into the literature, you surely can find alternatives where researchers used solvents like ethanol and ethyl acetate.

- Think of minimizing the consumption: One of the main energy consumption originates from fume hoods. By turning off the fume hood when it is not in use, the University of Nottingham saved between 5% and 25% of energy. Their “shut the sash” campaign is simple, but effective

- Think of better storage options: I would like to mention -80°C freezers. They are one of the most intensive energy consumers. You can start to save storage place with your DNA samples by discarding old ones. You can also store your DNA samples at -20°C instead of -80°C. Storing them at -20°C has

no impact on the DNA stability, even after 24 months.

We should never forget, even little actions sum up to a bigger impact!

### **Nowadays you are working on a world-wide campaign, „Freezer challenge“. Could you tell us what it is about?**

The freezer challenge is an international competition to promote good practices in the cold storage management. Every lab around the world can participate! You just need to register on their website, download the score sheet and fill it out with the actions your lab has taken. These actions include discarding old samples, defrosting your freezer and setting them to -70°C instead of -80°C. You do not have to fulfill every action. Just have a look what is feasible in your lab.

You can collect points by each action you are taking. In the end, the lab with the highest score will be awarded and even be announced in Nature. Also, there is a special EGNATON award for the three best labs in Europe. The deadline for this challenge was July 1st. Just to give some numbers, last year’s „Freezer challenge“ participants in the US saved 2.7 million kWh/year which is equivalent to reducing carbon emissions by 1900 tons.

**Hopefully, this interview manages to draw your attention to waste and consumption problems in our work life. If you would like to learn more about greener strategies, feel free to contact Dr. Kerstin Hermuth-Kleinschmidt**

**See you in a greener day!**

# Not without my data

Timo Gnadt, Göttingen eResearch Alliance

A colleague of mine was three months away from delivering his PhD thesis. He was well within schedule (presuming that anyone can ever be well within schedule at this stage). He had finished 90% of data analysis and about 70% of writing. One evening after work, he went to a local fitness centre to take his mind off things. He put his backpack with his working laptop into a locker and went sweating for 1.5 hours. When he came out of the shower, he noticed his locker was not locked at all. He was so upset he couldn't even remember if he really had forgotten to turn and pull the key, or if he had dropped it, or someone had even taken it from him. The fact was: His backpack was gone with all the work on his thesis stored on his laptop. He finally managed to recover some bits and pieces from sent emails and old data sets copied to his home PC. Nevertheless, he had to shift his delivery time by six months, and with enormous effort managed to finish only a barely acceptable thesis.

What can you do to prevent a disaster like this from happening to you? Sure, you can do backups. **Isn't this done automatically nowadays?** Do you really have to care about where and how such basic tech processes take place, or even monitor them? Well, yes and no. At Göttingen Campus, the GWDG offers Personal Drives ("P: drives") that are accessible from your work/lab computer and stored at central GWDG servers that are

backed up regularly and across different locations in Göttingen. The GWDG also offers other solutions such as cloud services, data archiving, or data synchronization across different devices. You can find a brief overview in Table 1. If you are interested in how to use these services, you can visit the GWDG website<sup>1</sup> to learn more, or contact the eResearch Alliance<sup>2</sup> to learn about our offers for free training or consultation for your research project or work group.

Although these services are very reliable, you should think about

improving your data safety by addressing the following questions: Can you access backed up files quickly enough when you need them? Can you restore your working system including its data?

The term "data loss" includes various scenarios on various scales, and nobody is safe from any of them. The main question you should answer to yourself is:

## **If I lose data, can I recover it?**

To be sufficiently prepared, you should make sure you have reason-

## Basic principles for doing backups

- **Create multiple backups:** Look up what the 3-2-1 rule is about.
- **Expect human errors:** Do not overwrite your last backup and keep older versions.
- **Do not use backup drives for sharing files:** A backup drive should serve only this single purpose and only be moved when absolutely necessary.
- **Store backups physically separate from your PC:** Don't keep both in your backpack.
- **Check backups regularly:** Try to recover random files once per month, to ensure data integrity.
- **Practice the worst case:** Make a full recovery dry run on a blank machine once a year.
- **Discuss the topic with friends** to learn about their best practices.
- **Include your mobile devices** in your planning, if suitable.

able strategies in place for all of the following scenarios:

1) You, someone else or even a software you trusted has **accidentally deleted or overwritten a file** or folder on your computer.

2) You, someone else, or a software (e.g. malware) has made changes to your computer that causes it to not start up anymore, so that **you cannot access your data** on your computer. This scenario also includes software that stopped functioning, for technical or license issue reasons, preventing you from reading the data format used by that program.

3) Your hard drive crashed (because of faulty design or age) or was destroyed by liquid, fire, electric pulses, or physical shock, or your laptop or PC was stolen. You can get hold of a new computer, but the **data on your old computer is completely lost** to you.

Nowadays, there are solutions to all of these scenarios, most of them at no or very low monetary cost. In fact, backup software is integrated in any modern operating system,

be it Windows 7 upward, Mac OS or Linux-based. If you are working with a Linux distribution, you will probably be the best person to find out which software suits your needs, how to install and configure it, or at least you can find out easily on the web. Here are some software names to get you started:

Déjà Dup, RSync, Back in Time, Bacula, Fwbackups, BackupPC.

If you use Mac OS, you will probably be aware of **Time Machine**. This has been part of Mac OS since 2007. For any external hard drive you plug in, you can choose to use it for Time Machine Backups and select those partitions or folders that you want to exclude from your backup – everything else is saved after you start the process, and changes are backed up any time you plug the hard drive back in. With your hard drive plugged in, you can then restore previous versions of files or folders. You can also use a Time Machine backup to restore your backups on a different Mac.

If you use Windows 7, you can use the integrated program **Backup and Restore** to configure and perform your backup. In Windows 8 and 10, there is an additional service called **File History**, which maintains versions of files in your personal folders and is integrated with in Windows Explorer. Windows also offers to create **system images** that allow you to restore your computer completely to a previous state. For re-installing Windows on a different computer, however, third party backup solutions are advisable. You can check Wikipedia for more info<sup>3</sup>. Keeping this in mind, remember that the main obstacle between you and a reliable and comprehensive backup strategy is your awareness of the data loss scenarios and the available solutions, and some manageable effort in the configuration and maintenance of your strategy. Now you can't claim anymore you didn't know how easy it is.

Happy backuping!

**Table 1: GWDG storage service**

GWDG service	Backup duration	File versioning	Data exchange		Storage	Cost
			@Campus	External		
<b>ownCloud</b>	90 days	yes	yes	yes	50GB	Work units of institute
<b>CloudShare</b>	Service ends in 2018, migration to ownCloud					
<b>CrashPlan-ProE</b>	unlimited	yes	no	no	unlimited	€29/year
<b>IBM TSM</b>	unlimited	yes	no	no	unlimited	Work units of institute

Links: <sup>1</sup><https://www.gwdg.de/storage-services> <sup>2</sup>[info@eresearch.uni-goettingen.de](mailto:info@eresearch.uni-goettingen.de)

<sup>3</sup>[https://en.wikipedia.org/wiki/List\\_of\\_backup\\_software](https://en.wikipedia.org/wiki/List_of_backup_software)

# Towards the “Resolution Revolution” in the 21st century

Arindam Ghosh

Conventional fluorescence microscopy took a big step forward with the emergence of super-resolution techniques. The „revolution“, as it is referred, began in the last decade of the 20th century and progressed with drastic improvements with time. Notable discoveries in this area received the Nobel Prize for Chemistry in 2014. Now, to put it into perspective, what is super-resolution? Let's take a look at the dimensions of microorganisms or biomolecules used to probe for solving many biological problems – a bacterium which is about 1  $\mu\text{m}$  in lateral dimension can be easily seen under a conventional diffraction-limited microscope, whereas a single virus ( $\sim 100$  nm) or a single protein molecule ( $\sim 10$  nm) could not be ‘resolved’ by the microscopes available till late 90's. This is solely due to the nature of diffraction of light, which limits the resolution of a conventional light microscope. As laid down by Ernst Abbe in 19th century, a good approximation of attainable resolution from such a diffraction-limited microscope can be estimated by  $\lambda / (2 \text{ N.A.})$  where  $\lambda$  denotes the wavelength of the light and N.A. refers to the numerical aperture of the objective lens used. Now, let's say one uses an objective of 1.4 N.A., oil immersion and illumination with  $\lambda = 650$  nm, then the resolution achieved is 232 nm. This, in a physical sense, means one cannot resolve two different points separated by a distance less than 232 nm and would see

them as one single spot. This problem, the so-called ‘Abbe's limit’, remained in place for more than a hundred years. Only recently, bright minds from different parts of the world came up with innovative solutions to overcome the diffraction barrier. To mention the name of a few, STED, STORM, NSOM, PALM, RESOLFT, PAINT, SOFI are amongst the prominent ones. Since it is beyond the scope of this article to discuss all of them in detail, we will focus on the research being done in Göttingen in this context.

The „City of Science“ is the hub of STED microscopy. It was developed by the Nobel laureate Prof. Dr. Stefan Hell, who leads a department at the MPI for Biophysical Chemistry. Presently, the technique is being used by many groups in the fields of experimental medicine and biology to look at the previously unresolved structures of biomolecules and sub-cellular organelles. In principle, STED uses two laser pulses, the excitation pulse to excite fluorophores to their fluorescent state, followed by a powerful STED laser pulse. As a result of the non-linear dependence of the stimulated emission rate on the intensity of the STED beam, the fluorescent molecules around the focal excitation spot will be in off state. The lateral resolution achieved by STED is dependent on the intensity of the STED beam. One prominent study demonstrating the power of STED was published by Eggeling et al. in

2008 [1] where the authors observe nanoscale dynamics of single lipid molecules on plasma membranes of living cells. Another technique, known as RESOLFT or Reversible Saturable Optical Fluorescence Transitions, exploits fluorescent proteins which can be reversibly switched between dark and bright states using light of a particular wavelength. The latest development from the group of Prof. Hell is MINIFLUX, which reduces the number of fluorescence photons required for very high localization precision. As published recently, with the use of 22 times fewer photons, one attained  $\sim 1$  nm localization precision while resolving molecules only 6 nanometers apart.

Taken together, these techniques are influencing modern biology since they are able to discern fluorescent molecules or features closer than the diffraction limit. The research group headed by Prof. Dr. Jörg Enderlein at the Third Institute of Physics at the University of Göttingen is also involved in the development and applications of new super-resolution techniques based on fluorescence microscopy. One such microscopy technique is SOFI, or Super-resolution optical fluctuation imaging (SOFI), which is a post-processing method for calculating super-resolved images from a recorded image time series based on time-dependent correlations of fluorescent molecules stochastically switching between „on“ and „off“ states. Examples of such fluoropho-

res include engineered fluorescent proteins which are reversibly photo-switchable and quantum dots. Most importantly, SOFI can be done using a standard wide-field illumination microscope and doesn't demand any complex set-up. A comparative figure from a conventional wide-field microscope and post-SOFI analysis is presented in Figure 1 showing the resolution improvement.

All the techniques mentioned provide a resolution improvement in the lateral dimension. But only a few methods have been devised that enhances resolution in the axial direction i.e. along the optical axis of the microscope. Namely, these are 4Pi microscopy, interference PALM (iPALM). However, these methods demand complicated microscope setups and analyses. As an alternative and simpler solution, a new technique known as Metal-Induced Energy Transfer (MIET) was recently developed in the group of Prof. Enderlein. Using MIET, one determines the excited-state lifetimes (the time duration a fluorophore spends in excited state, usually in nanoseconds) of a fluorescent

### 3D stack of 2D SOFI (QDs)

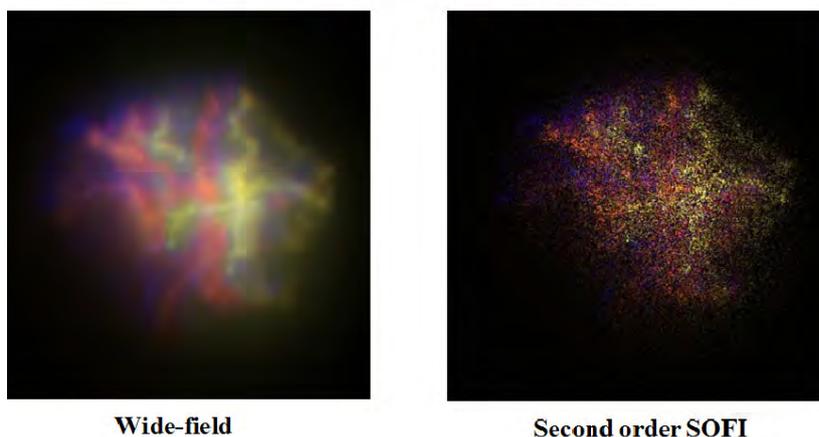


Figure 1: Comparative image showing quantum dots (QDs) imaged with conventional wide-field illumination and 3D stack of 2D SOFI images © Soheil Mojiri

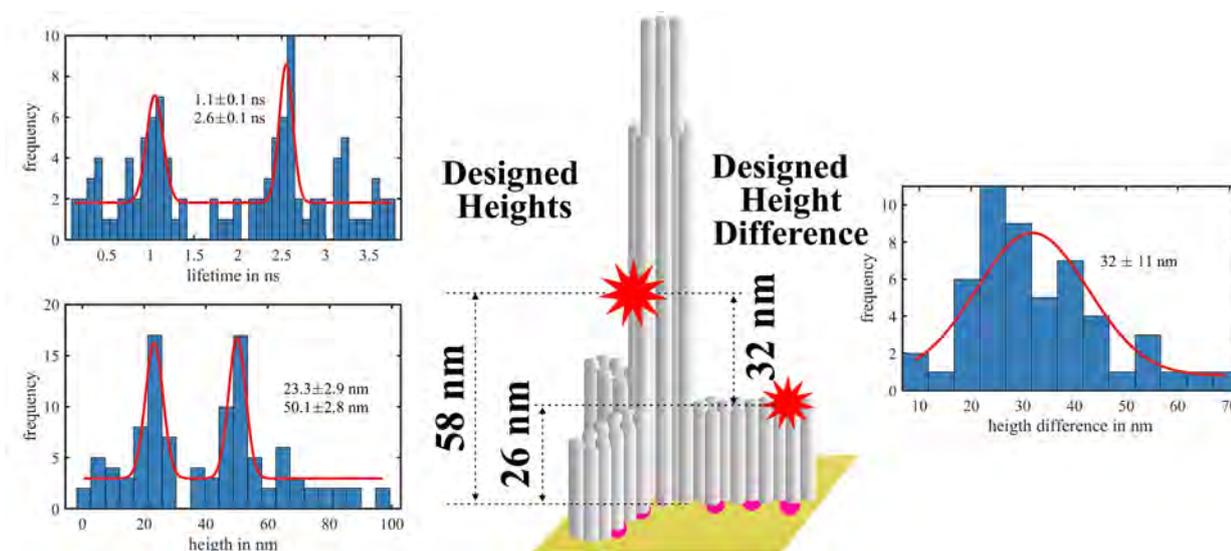
molecule at different heights from a thin metal film evaporated on glass. The underlying principle is a distance-dependent quenching process i.e. decrease in fluorescence intensity and lifetime when a fluorescent emitter is close to the metal surface. The lifetime values measured experimentally can be converted to physical distance values using a mathematical model. Published results on this technique indicate a localization precision of  $\sim 2.5$  nm. Figure 2 shows the basic idea of a MIET experiment where a designed DNA nanostructure has fluorescent molecules labeled at different heights. The technique can also be

combined with existing ones like PAINT and STORM to achieve an isotropic nanometer resolution in all three dimensions.

In conclusion, the past decade has witnessed the dawn of super-resolution techniques in fluorescence microscopy, leading to improvements which will truly enable us to revolutionize the fields of biology, medicine and applied chemistry.

#### References:

- [1] Eggeling, Christian, et al. Nature 457.7233 (2009): 1159.



Scheme showing the experimental design of a MIET experiment on DNA origami nanorulers attached to a gold film (yellow) via thiol (pink) linkage. Additionally fluorescence lifetime histogram and height distribution are also shown. © Sebastian Isbaner and Dr. Roman Tsukanov

# For the love of research: An interview with Dr. Travis Carney

Candice Dcosta

You can't qualify him as just a researcher. Travis Carney is a man of many things - travel, animals, movies. But at his heart, a researcher is what he is. He has a strong affinity for research and is a great teacher. He is approachable and receptive to new ideas. In addition, he talks about his research and science with immense passion and enthusiasm. That, paired with his great sense of humor, is inspiring.

## Can you tell us a little bit about yourself?

I come from the beautiful state of Idaho in the United States of America. I've worked hard for my achievements and had great supervisors and teachers to guide me to this point. I am currently employed as a post-doc at the Max Planck Research Group - Gene Expression and Signaling at the MPI-bpc, headed by Dr. Halyna Shcherbata.

## What is your science background? What was your journey until here like?

I have come a long way from home, and it's been an interesting journey so far. I worked in a research lab as an undergraduate student, which sparked my interest in academic research. Therefore, I chose to continue with a short research program at the Los Alamos National Laboratory in New Mexico and went on to graduate school at the University of Oregon. My journey was challenging, exhausting, rewarding – and a lot of fun!



© Travis Carney

## What is your current research focused on?

In my lab, I study the role of genes in animal development, and I am particularly interested in stem cells and cell differentiation. I focus on noncoding RNAs required for the proper development of germ cells. For my studies, I use *Drosophila melanogaster*, a model organism that allows unparalleled in vivo genetic manipulation. In addition to a variety of genetic techniques, I work extensively with confocal microscopy and molecular techniques like real-time polymerase chain reaction (PCR) and molecular cloning.

## How do you think your research can help the scientific community?

Noncoding RNAs have been shown to play roles in disease states. My research aims to highlight their importance in cell communications

and their function in determining cell identities.

## What do you find the most rewarding about science?

Uncovering something new, undiscovered, however small it may be. It gives one a sense of achievement. Moreover, I like naming genes! [He named a neural differentiation gene *midlife crisis* in 2013].

## What do you like to indulge in besides research?

I love the outdoors; nature; activities like kayaking and hiking; encountering wildlife in their natural habitat; travelling on rustic, off-beat paths. I thrive on unique experiences in life.

## Every researcher is interested in learning how to maintain a good work-life balance. What's your secret?

My wife! I love my work (i.e., my flies!) so much that it is difficult for me to tear myself away from it. But my wife plans amazing trips for us and makes sure that I take some time off to maintain that balance. We both love to travel, and once we hit the road, the flies are left at work and I revel in the amazing new sights and adventures!

### **Do you have any pearls of wisdom for current PhD students?**

Try not to get too discouraged by mistakes, failed experiments, and unexpected results – they are all a normal part of research! Rather, be thoughtful and learn from these experiences. The excitement and satisfaction of cool discoveries will more

than make up for these unfortunate experiences. In addition, keep an open mind to career opportunities outside of academia after your PhD. The job of a PI is not for everybody, but many rewarding, alternative paths exist that should not be overlooked!

## Interview with Dr. Ricarda Richter-Dennerlein

Dr. Ricarda Richter-Dennerlein is a junior research group leader at the department of Cellular Biochemistry at the University Medical Center Göttingen since 2016.

### **Could you tell us about your research?**

My research group is focusing on the assembly pathway of the human mitochondrial ribosome. It is essential in the synthesis of mitochondrial proteins. The human mitochondrial ribosome is of great interest as there is a growing group of patients with severe human diseases associated with mitochondrial dysfunction caused by mutations in mitoribosomal proteins. Interestingly, the clinical presentation of these patients is very diverse, although the same protein machinery is affected. We would like to understand this phenomenon on the molecular level and analyze disease associated mitoribosomal proteins in more detail and aim to define the assembly of this unique complex.

### **Why did you start to work on this topic?**

My interest in the mitochondrial translation machinery and in particular the mitochondrial ribosome started during my PhD, when I characterized a novel mitoribosomal protein, of which the bacterial homologue is not a structural component of the bacterial ribosome. I began to be very intrigued about the mitochondrial ribosome, which shows so many differences to its bacterial ancestor and I always wanted to know how this complex, which is of dual genetic origin, is built together.

### **What was your personal path to become a PI?**

I studied Molecular Biotechnology at the Technical University in Dresden and during my bachelor thesis I studied the ubiquinone synthesis in yeast mitochondria. Thus, I started very early to be interested and fascinated in these essential organelles. Then, I went to the United Kingdom for two internships,

Daryna Tarasenko

first to Newcastle University and second to the University of Leicester. During my stay at the Newcastle University, I got the offer to do my PhD in the Mitochondrial research group under the supervision of Prof. Lightowers and Prof.



© R. Richter-Dennerlein

Chrzanowska-Lightowers. For my first post-doc position I went to the University of Cologne, at which I worked for three years in the research group of Prof. Langer. In 2014, I came to Göttingen

to do a second post-doc in the research group of Prof. Rehling. During that time I successfully applied for an Emmy Noether grant at the DFG and since 2016 I am an independent junior group leader at the Institute for Cellular Biochemistry.

**From your experience, what are the most important points one should consider before choosing an academic career path?**

In my opinion, you absolutely need passion for research and science. If you do this only because you want to earn money and to have a job, industry might be the better choice. I think you have to make some sacrifices, meaning working during weekends or late in the evening should not be a problem during your PhD or post-doc. However, what I do not believe is that you have to decide between having career and having a family. I have both, which can be very tough sometimes, but it is possible.

**How much does international work experience matter for a successful academic career? Nowadays, would you still recommend to head to the UK or USA?**

To my mind, having some international experience has really some advantages, not only scientifically, but also personally. However, I am not sure whether I would really recommend UK and USA nowadays. It probably depends on the research field, whether it is worth to be abroad or not. Nevertheless, I really think that it is essential to change labs and research groups. It is important for the scientific and personal development

not to stay at the same university for your bachelor, master, PhD and post-doc just because it might be comfortable.

**What would be the three most important skills to develop for PhD students who aim to make a career in academia?**

Be focused, know what your priority is!

Be able to take criticism, otherwise you will not improve and learn!

Be enthusiastic, science is all about asking questions and to be curious!

**What do you find the most challenging and the most rewarding about science?**

To always be afraid that someone else publishes before you can sometimes be difficult to handle. Further, new techniques are improving our lab work, however, they increase also the standards what might be required for a story to get published in a good journal.

However, in the end, if you get your data published and you get good feedback for example at a conference, it is really rewarding and you should always enjoy these moments!

**What or who inspires you scientifically?**

Mitochondrial dysfunction can cause severe human diseases often

with fatal consequences. Such dysfunction can occur at any age - early after birth or later in life. The number of patients with mitochondrial disorders is high - one in 2000 individuals is affected. To understand the cause and the molecular basis of such mitochondrial disorders motivates me a lot.

**Where else do you get your motivation from?**

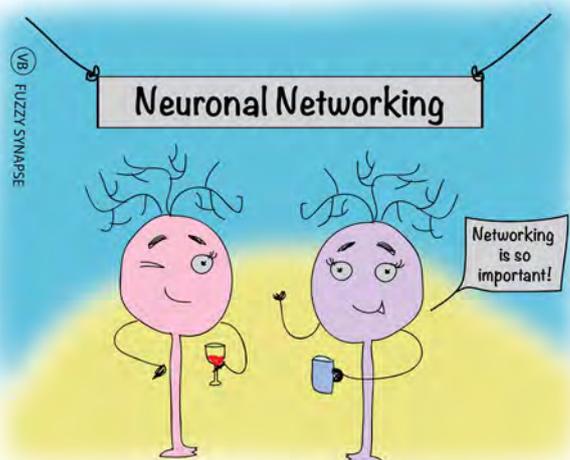
My family. I think it is really important to have the right balance.

**Do you miss the bench work?**

Sometimes yes, but I also have to admit that I really enjoy the supervision of my students, to analyze, and to discuss their results and to see their developments and improvements.

**Any tips on time management?**

You have to prioritize. Do not spend too much time on things which do not need to be perfect. Whatever you can do immediately, do it and do not accumulate outstanding tasks. Plan your experiments and your week(s) in advance.



# Many roads lead to New York City

Sarah Port & Cindy Wechsler

In the cold January air of 2018, Cindy and Sarah meet at a rooftop bar in Manhattan. Cindy is in New York City for a business trip for Pfizer, the American pharmaceutical giant. Sarah is pursuing her post-doc studies at Princeton University, a heartbeat away from New York City. They both started their PhDs in the GGNB Biomolecules program in 2010/2011 in Göttingen, many miles from where they are now.

Cindy was a part of the Bioanalytics Group: she worked on enzyme kinetics and optimization of enzymes for use in the synthesis of pharmaceutical precursors. Sarah worked on the structure and function of the proteins involved in nucleocytoplasmic transport in the Department of Molecular Biology. Finding common ground in structural biology, they first met at one of the GGNB method courses. Shortly after, they headed the organizing team of the second WoCaNet (Women's Careers and Networks) symposium in 2013.

They spent a lot of time together during the WoCaNet organisation and regardless of any organisational challenges, they had a wonderful time and became close friends. After a successful WoCaNet, the next goals were finishing up

their PhDs and figuring out future career paths.

Despite her initial inclination towards a job in the industry, after graduating, Cindy first took up a post-doc position at the University of Freiburg in the Department of Pharmaceutical and Medicinal Chemistry. Cindy reminisces about her arrival in Freiburg, saying "I fell in love with Freiburg almost immediately; a beautiful, small, picturesque town in South Germany. The quality of life in Freiburg is excellent, with many recreational activities. After my post-doc, I began a job at Pfizer as Manager - Site Compliance for Regulatory Affairs and Compliance in September 2015. It's been almost three years since, and this place never ceases to amaze me. In May 2018, I was promoted to the Interim Team Lead Site Compliance, after being Support Team Lead for several months. My Team is responsible for the analytical procedures and registration samples as well as the regulatory compliance in Freiburg. I enjoy working in an international and innovative company, as it offers a lot of opportunities and fascinating projects. I get to be a part of Launch Teams, bringing new innovative drugs to the markets, and work on state-of-the-art developmental projects and new manufacturing technology. Working with colleagues worldwide gives my job a fresh outlook on a daily basis. It never becomes a routine! As a part of multinational teams working on the registration of newly developed drugs, I had the oppor-

tunity to travel to one of our US sites in 2017 and 2018. This is when I met Sarah in New York City: these trips give us a wonderful opportunity to catch up! I loved my time in academia and I now love my work in the industry. I am grateful for the network GGNB has offered, and I still use it today to keep in touch with many old GGNB buddies. It makes me happy to follow their career paths and see them grow and flourish in life."

After her PhD, Sarah started a post-doc in the lab of Fred Hughson at Princeton University in May 2016. She talks about her experience: "Princeton is a small college town in central New Jersey in the United States, known for its University and the Institute of Advanced Sciences, where Einstein worked. At Princeton, you find not only great science and scientists, but also an incredible infrastructure to prepare you for your goals. From workshops and personal coaching to numerous seminars by famous scientists, writers, politicians, and musicians, the activities are remarkable! Last year, I joined the Post-doctoral Council (PDC) at Princeton University wherein I help organise career-development and social events for postdocs and try to improve the standing of postdocs at the university. My work in the PDC improves my organisation and communication skills, but it's also fun and I meet a lot of fellow postdocs and new friends this way.

From a research viewpoint, the first two years at Prin-

Alumni

Alumni

ce-ton were educational and chal-lenging, but also inspirational. The process of putting together a project and writing proposals for grants, learning new techniques, juggling experiments, and attending confe-rences and numerous networking opportunities with amazing scien-tists make it a time-intensive, but a memorable endeavor. Although I don't know what the future will bring, I am happy to have the op-portunity to do what I love for as long as I can."

So every now and then, when Cindy is in New York on a busi-ness trip, Sarah hops on a train to meet her, and they enjoy the perks of New York City and reminisce



Sarah and Cindy on the roof top terrace of the Metropolitan Museum of Art  
© Sarah Port

about their time in Göttingen and York City, even though they picked the mysterious ways that life works completely different careers in com-pletely different parts of the world!

## Computational biophysics at the heights of the Andes mountains

Camilo Aponte-Santamaria

I grew up in Bogotá, the capi-tal of Colombia. This city, marked with its beauty and rich history, became the foundation of my career in science. I began my journey in Biophysics starting with a PhD at the IMPRS Physics of Biological and Complex Systems (PBCS) be-fore the GGNB was established; I was one of the first students of the IMPRS PBCS. After comple-ting my doctoral studies in 2011, I took up a postdoctoral position in Heidelberg for 5 years. After my doctorate, I wanted to pursue an academic career, and at the same time, help develop my country with my professional knowledge. In the spring of 2017, I was appointed the head of my own research group in Bogotá. This po-

sition was an ideal opportunity for me to achieve my goals by conduc-ting cutting-edge research while contributing to the education of others. My group is one of the Max Planck tandem groups recently estab-lished in Colombia. It is a part of a Colombian-German collaboration to establish highly competitive re-search groups in Colombia with the support of the Max Planck Society. In particular, my group focuses on the theoretical and computa-tional study of biomolecular systems. We are based at the University of Los Andes and are hosted by the Max Planck Institute for Medical Research in Heidelberg.

My job has been a positive and joyful experience. Our group dedi-cates its time almost exclusively to

research, which is highly valuable and unique in Colombia. I have met highly motivated and intelligent students as well as collaborators/colleagues during my time here. It's a delight to discuss biophysics and other scientific topics with them. As a young group leader, apart from scientific work, I have been endo-wed with new responsibilities as well. For instance, I try to create a highly stimulating environment for the group members and advise them about successfully developing their own projects. Fortunately, the excellent group of people sur-rounding me - students, professors, and administrators - have always supported me in overcoming these new challenges. We have also main-tained a permanent exchange with

our research partners in Germany, assisted by our host department in Heidelberg.

Bogotá is beaming with an untapped potential for scientific research, and I am happy to be part of a team exploring what this city has to offer to the scientific community. Since no successful venture comes without its unique challenges, I, too, faced my own set of challenges in Bogotá. One of the noteworthy challenges was readapting to the rhythm of Bogotá, a megacity with over 8 million inhabitants (70 times the population of Göttingen). For example, the modes of transport vary greatly between Germany and Colombia. In both Göttingen and Heidelberg, I could travel around by bicycle and reach my destination quickly. However, in Bogotá, commuting is time consuming, and the use of bicycles is limited, although the city is slowly improving its infrastructure, for instance with the establishment of bike lanes. Fortunately, I was able to find a good strategy to commute every day that involves bicycle and public transportation. With the help of my background in data sciences,



On campus with my group © Camilo Aponte-Santamaria

I consider my daily experience as an opportunity to determine what improvements could be made to our transportation system. The air pollution is another serious issue in Bogotá today. Therefore, I am investing part of my research efforts to understand, with the tools of computational biophysics, the effects of certain air pollutants on human health under the high-altitude conditions of Bogotá, which is located at a height of over 2500 meters above sea level.

In summary, I believe Colombia has enormous opportunities for quantitative biosciences. Transnati-

onal cooperation frameworks, as the one established between Colombia and Germany, from which I am currently benefiting, are excellent setups to attract highly talented individuals to work in Colombia and tackle current challenges in biodiversity, health, and agriculture.

Dr. Camilo Aponte-Santamaria is Group Leader of the Max Planck Tandem Group in Computational Biophysics (MPTG-CBP) in Bogotá, Colombia.



View of Bogotá's Central Business District from campus © Laura Milena Forero Junco

# Alumni Survey

Ting-Hsuan Lu, Shama Sograte Idrissi

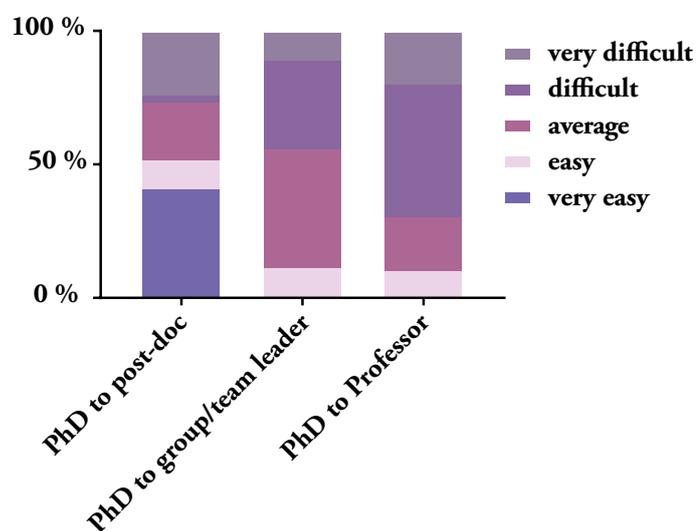
## Introduction:

What is the next step after the PhD? This is one of the fundamental questions we will all ask ourselves at some point. There are many roads a PhD holder can take. We sent out a survey to alumni of the various GGNB programs, asking them about their current jobs, life satisfaction as well as personal insights and experiences. 130 alumni responded.

Here we report a summary of the data acquired in this survey. First, we describe the transition phase to a new position, within and outside academia. Second, we report what kind of benefits the alumni gained during their time in Göttingen. Third, we selected some inspiring advice from the seniors. Fourth, we present you the various professions the alumni chose. We asked them to rank their happiness and work-life balance from 1 (min.) to 5 (max.), what their main tasks are and if they have any thoughts on their jobs.

## Transition within Academia:

Transition from a PhD to a Post Doc position was generally described as easy, with challenges arising if the new position was in another country (e.g. because of family integration). Many feel that their transition is still ongoing since the postdoctoral researcher position is not permanent.



“My mistake was to accept an offer too quickly. I got an offer for a postdoc position when I was still working in my PhD lab. To be able to start a postdoc as fast as possible, I did not consider very important details for the selection of a proper lab for a first post-doctoral experience, for instance good mentoring, flexibility and predisposition to discussion from the PI.” (Post doc)

“Getting the first postdoc is easy when you come from a lab with enough connections. The following steps that should lead to a permanent job are more obscure.” (Post Doc)

“The academic research field is very competitive, and nothing is permanent. You have to fight to publish and to get grants. But that is what I choose to do since I had my PhD.” (Professor)

## Transition outside academia:

The transition from a PhD in academia to industry is generally described as very difficult. It took up to two years for some of the alumni. Having no network or no referrer is mentioned as a big obstacle in the transition. Knowing which position in industry one wants to obtain, was found to be very helpful.

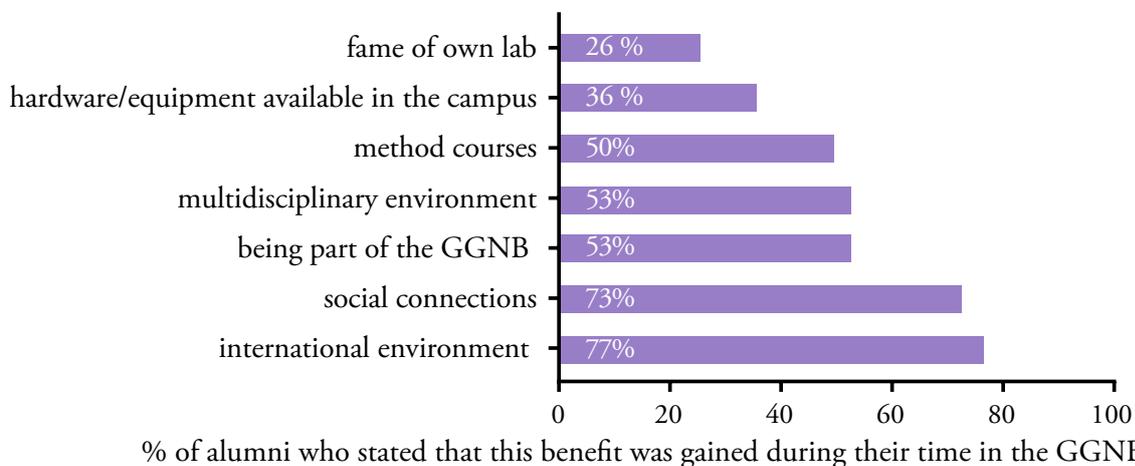
“The requirements for industry positions are very different from academia. I was totally unaware how important people skills are for industry recruiters and how much they value practical skills in your resume. Also, the working environment is the opposite of academia - teamwork above all, metrics are the king, creativity and open-mindedness are hard to come by”. (Manager non-R &D)

“The most challenging is to prove that you really have transferable

soft skills and that you are not only a pipetting robot at the bench. The first job out of science after PhD is hard to get, but as soon as you have some (at least 1 year) experience your value on the job market sky-rockets and every next job search gets easier. Transition itself is not difficult, you have finished a PhD, so you can manage anything => Of course there is a steep learning curve, but after half a year even in a completely new role you are fine”. (Coordinator science administration)

I was pretty sure about what to do after my PhD and I worked partly in favor of that during my PhD time. So, in my case it was two applications to get this Job”. (Manager R&D)

“Transitioning after a PhD to any other job is quite difficult. Having seen no other job than the lab, you do not know how to scale your expectations from the advertised jobs, nor do you have a realistic estimation of your chances”. (Clinical trial management)



## Advice from your seniors

“HAVE A LIFE NEXT TO YOUR PHD! WORK YOUR HOURS (IN A PRODUCTIVE WAY) AND IGNORE THE PEER PRESSURE TO SPEND MORE AND MORE HOURS IN THE LAB. A PHD IS A LONG DISTANCE RACE, YOU CAN'T SPRINT THE WHOLE WAY WITHOUT BURNING OUT!”

“BE OPEN-MINDED, EXPLORE NEW AVENUES AND OPPORTUNITIES FOR DEVELOPMENT, NETWORK, LEARN GERMAN (!)”

“TAKE YOUR PHD SERIOUSLY, BUT NOT TOO SERIOUSLY. UNLESS YOU STAY IN ACADEMIA, NOBODY CARES ABOUT THE CONTENT OF YOUR THESIS OR WHETHER YOU'VE PUBLISHED ANY PAPERS. WHAT THEY DO CARE ABOUT IS THE PERSONAL DEVELOPMENT YOU ACHIEVED DURING YOUR PHD E.G. WORKING IN A TEAM, MANAGING A PROJECT, DEALING WITH SETBACKS ETC”

“SET CAREER GOAL AS EARLY AS POSSIBLE AND DO NOT DO THINGS JUST BECAUSE YOU OUGHT TO. THE SUCCESS OF YOUR PHD PROJECT MEANS LITERALLY NOTHING FOR YOUR FUTURE LIFE.”

“YOU KNOW MORE THAN YOU THINK YOU DO. BE MORE SELF-CONFIDENT AND TAKE CHARGE OF YOUR PROJECT”

“TAKE BREAKS FROM YOUR RESEARCH AND LOOK AT YOUR DATA FROM A DIFFERENT ANGLE. DO IT AND DO IT OFTEN! DON'T TAKE TOO MANY PROJECTS.”

“SCIENCE ASKS A LOT FROM US AND OFTEN DOES NOT PAY BACK AS ONE WOULD EXPECT. WHAT I WOULD TELL THE YOUNG VERSION OF MYSELF IS JUST TO NEVER GIVE UP AND ALWAYS LOVE YOUR PROJECT, BECAUSE THAT IS THE ONLY WAY TO OVERCOME DIFFICULTIES AND TO DO SCIENCE IN THE RIGHT WAY.”

“THINK MORE, DO LESS”

“BRANCH AND CONNECT. PERSONAL COMMUNICATION IS THE KEY. BE POSITIVE AND ACKNOWLEDGE THE OPPORTUNITIES YOU HAVE”

“DO GO OUT TO CAREER FAIRS AND READ JOB POSTINGS EVEN IF YOU THINK YOU MIGHT NOT BE INTERESTED, THERE ARE MORE DIFFERENT TYPES OF JOBS IN THE MARKET THAN YOU KNOW. THINK WHAT YOU ENJOY MOST (OR LEAST) ABOUT BEING A RESEARCHER AND TRY TO FIND THE KIND OF JOB THAT WOULD FOCUS IN THIS.”

# Alumni Statistics

## 40.8% Postdoctoral researcher



Happiness



Work/life balance

### Main tasks:

lab experiments, literature research, developing and writing

Although they love their work, the lack of a perspective or future in science is the most concern to them.

*"No clear boundary between work and life, but this is normal in academia!"*

*"It's hard to stop thinking about your current research problem at home."*

## 9.2% Professor



Happiness



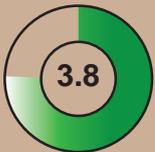
Work/life balance

### Main tasks:

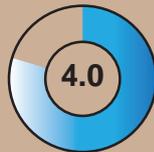
communication, teaching, literature research

*"Freedom to choose research topics and work at my own pace."*

## 3.9% Staff media/publishing



Happiness



Work/life balance

### Main tasks:

communication, management, literature research

*"I do enjoy the writing part and being allowed to work on several different topics. However, I miss being responsible for a project as a whole."*

## 3.8% Consultant



Happiness



Work/life balance

### Main tasks:

communication, training, troubleshooting, support

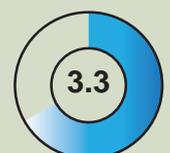
*"I miss some more practical science."*

*"A lot of free time and a nice balance between work and down time."*

## 3.9% Marketing



Happiness

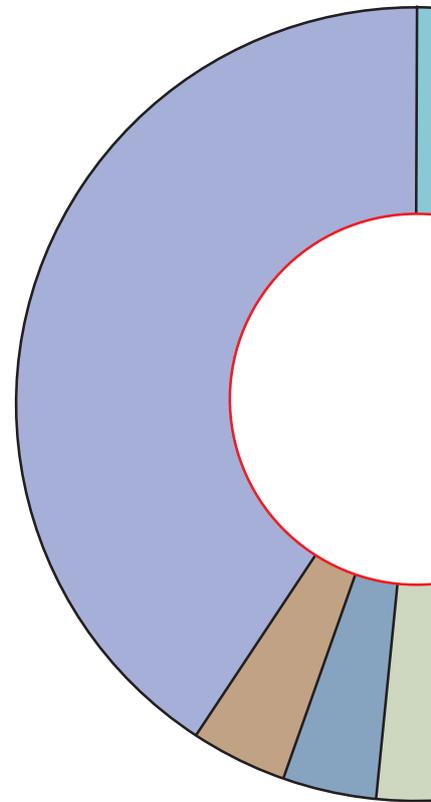


Work/life balance

### Main tasks:

management, sale advertisement

*"The job contains highly diverse parts with work related to experience gained during Diploma/PhD and work ranging from classical sales to marketing."*



### 2.3% Lecturer



Happiness



Work/life balance

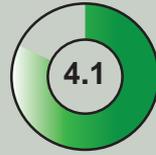
**Main tasks:**

teaching

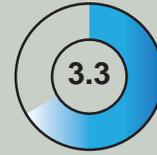
Teaching and inspiring the next generation is what they enjoy the most.

*"I can't avoid taking work home especially since I need to prepare for a new topic of lecture every week."*

### 7.7% Group leader



Happiness



Work/life balance

**Main tasks:**

leadership, literature research, management

### 3.9% Scientist in Industry



Happiness



Work/life balance

**Main tasks:**

lab experiments, clinical research, technical development, project management

### 3.9% Manager non R&D



Happiness

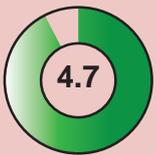


Work/life balance

**Main tasks:**

management, leadership, communication

### 6.1% Manager R&D



Happiness



Work/life balance

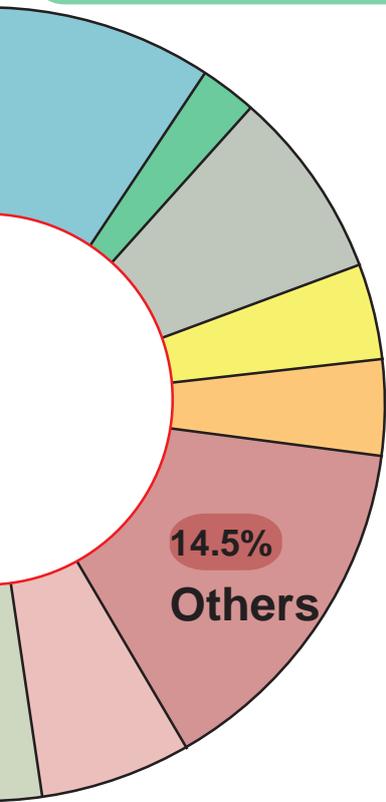
**Main tasks:**

management, developing, literature research

*"I feel I have to be very disciplined to acquire some time off without being available all the time."*

## Conclusion

All in all, the alumni survey painted a very optimistic picture for our future. PhD graduates from various GGNB programs have discovered and taken advantage of many different job opportunities. The consistently high reports of happiness suggest that even if the transition into the new position is hard, the work eventually pays off. Finding out what one wants to do is often a deep and personal quest. We hope that this article could inspire you and help you to find an answer. If you are interested in contacting the alumni, you can visit the GGNB alumni database or the GAUSS Career Service.



# The road not taken

Vinita Bharat



© Vinita Bharat

I remember this poem from my high school classes and have always considered it to be special. The choices and opportunities shape your life's journey – this is what I took as a take-home message from this poem.

Getting the opportunity to be a part of IMPRS Neurosciences MSc/PhD program, learning how to be a researcher, living far away from your home country is the road I took in 2010. And now, after spending seven years there, I can happily say that I loved my journey and road taken! Graduating from Göttingen after kissing the Gänselesel (this was so special about this city!) seemed like one of the best decisions I made. I was fortunate enough to have the best mentors, and a great group of friends in Göttingen. I learned scientifically and personally so much in the time spent there that it will always remain with me for the future.

During my PhD, I studied and gained expertise in understanding long range vesicle trafficking in hippocampal neurons of rodents. I was really not sure which road to take after my PhD, as I always felt strong about science communication, the need to connect science and the world and yes, loved doing research in spite of days and weeks of non-conclusive experiments.

In November 2017, to pursue my interests in research, I joined Stanford University as a postdoctoral researcher in the Department of Neurosurgery. Göttingen is rightly called the science city as you are surrounded by your fellow scientists all the time, which I found so different after coming to the bay area. Here, with all the challenges to move to a totally new country, applying for visa (again!), leaving your comfort niche, this road has

its own colors and charm. I transitioned from understanding basic cellular and molecular neuroscience to working with clinical neuroscience. Currently, I am working here with patient derived induced pluripotent stem cells (iPSCs) to understand the mitochondrial functions and dynamics in neurodegenerative diseases.

Also, to continue my passion towards science communication, I started my platform called “Fuzzy Synapse” ([www.fuzzysynapse.com](http://www.fuzzysynapse.com)) where I draw science illustrations and cartoons to depict and convey science to a broader audience with a pinch of humor.

In the end, I would say “Don't cry because it's over, SMILE because it happened!”.



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# How to become a lab athlete

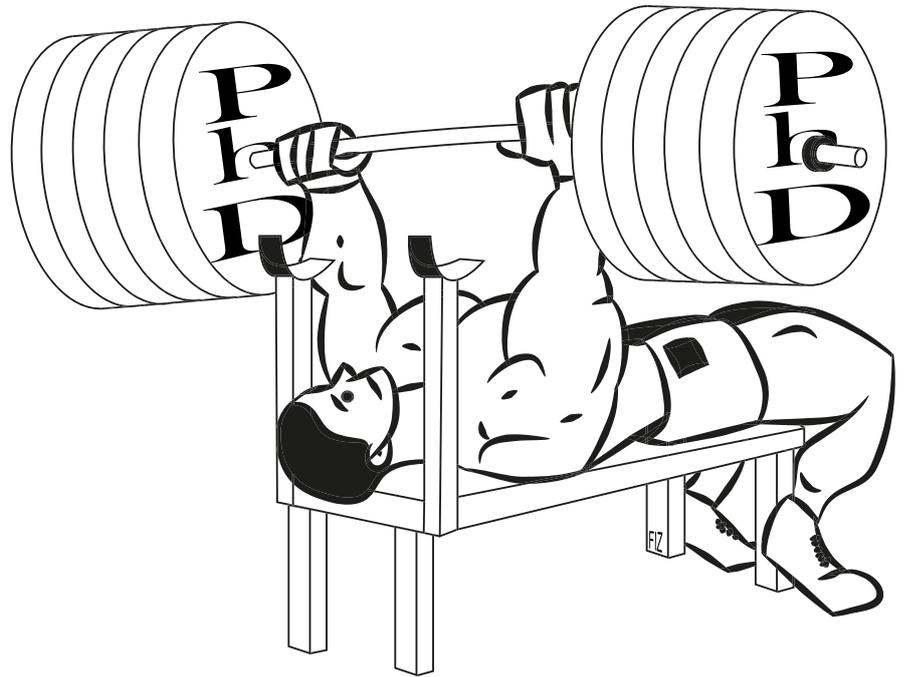
Georg Hafner

Do you know what a tennis elbow is? It is a condition in which the tendons in your elbow are overloaded and become sore due to repetitive motions of the forearm muscles.

The overuse of one particular motor pattern does not strengthen the executing muscle but instead weakens it in the long run. For this reason, athletes do not solely train movements of their discipline. For example, professional tennis players incorporate resistance and weight training, cardio and flexibility exercises in their training regime as well. Training time off the tennis court is equally valuable to their performance. They need to become stronger, faster, fitter and healthier overall.

Eventually, this will allow them to become better at tennis. But what if you have a job in which you mostly think? How would you train for creativity and problem solving?

Figuring out what experiments one should do and why they do not work is an integral part of a PhD. Of course, the daily work of a PhD student mostly consists of hands-on activities but progress in these technical aspects



PhD at the bench © Georg Hafner

is usually secondary. At least I have not heard of somebody who runs a dozen gels every day just to become faster at filling their pockets. Instead, the design of an experiment and the interpretation of its results are the important skills that determine the success of a project. Usually when a problem occurs, we are trained to work harder on it. We should read about the topic, refine the technique, repeat the experiment, consult experts in the field – basically, we should narrow down our focus on one particular aspect. However, it could be counterproductive to fixate yourself on one problem too much. Eventually, you will end up with a mental tennis elbow. The mind can stagnate, too. The lines of thought can become rigid and sore just like tendons. For example, have you ever failed to write a concise first sentence of an abstract despite all your knowled-

ge about a project? Have you ever made a mistake in your analysis that you spotted right after you came back from a holiday? There are ways to prevent a mental tennis elbow though. You have to exercise your mind holistically to become a smarter and more educated person in general. For that you have to engage in activities outside the realms of your project. The first step could be to expand your knowledge about other science topics. A project is never an isolated haven of research. Perhaps the analysis of your neuroscience data could be borrowed from geography or you need mathematical tools to crack your problem.

Equally valuable for a flexible mind is engagement in activities outside of science. Exercise your body. Regular physical activity is not only highly beneficial for your mental well-being but it demands discipline and re-

Göttingen

Göttingen

quires mental toughness. Those are both attributes valuable for long-term success. Learn an instrument. It nurtures your power to concentrate and coordinate. Playing in a band or an orchestra increases your capacity for teamwork. Take chess classes. Strategic thinking will be your reward. Learn a new language. It keeps your mind active and dynamic. Furthermore, it gives you insight into a new culture and thereby enhances your openness for diffe-

rent things. Join a cooking course. You will realize that the complexity of a recipe for beef wellington surpasses the one of your last cloning protocol. Learning how to fine-tune particular steps in a sophisticated sequence of actions is only one of many skills that can be directly translated from the kitchen to the lab. No matter what activity you decide on, being knowledgeable and passionate about something outside of lab work, makes you a more inte-

resting person. During a PhD, one has to face numerous situations in which the original line of thought has to be changed and new ideas have to be developed. A flexible and active mind is highly advantageous in mastering all the challenges. If you train your mind outside of the lab, you will perform better inside the lab. You will become a smart lab athlete and a successful scientist.

## Express your art in Göttingen

Michael Berger

If you listen to conversations among graduate students, you sometimes might think the graduate students' life is about work, work, work with no time for anything else. But this is not true. The way towards your doctoral degree is a time in your life when you should engage yourself in various activities and try out something new. Such activities do not have to be about science. Especially in Göttingen, a university town, plenty of opportunities are available for students. For instance, you can exercise a multitude of different sports at the university's sport center or you could join the GGNB Times and become an editor. There is not enough space to list all opportunities here, but we would like to tell you about five organisations for students which give you an opportunity to act in a theater, perform music or manage a cinema.

We talked to Theater im OP (ThOP), a place at which you can perform on a theater stage; Unimusik, consisting of the Uni-choir and Uni-orchestra,

at which you can sing or play an instrument; Akademische Orchestervereinigung (AOV), another orchestra at which you can show your instrument skills; Die Blauen Sänger, a music-focused students' association that offers a choir, an orchestra, a big band and stage acting for every student (not only members); and the Unikino, a place for movie enthusiasts who always wanted to run their own cinema.

Most of those organisations are centered around music. You can sing in a choir (Uni-choir or Die Blauen Sänger) or play an instrument in an orchestra (Uni-orchestra, Die Blauen Sänger or AOV). At the beginning of each semester, the groups look for new members. Over the course of the semester you will practice a piece until you present your skills at concerts at the end of the semester. Which group suits you best depends to some degree on your skills. Obviously, you need to know an instrument to play in an orchestra. Die Blauen Sänger are probably the most

„newbie-friendly“ group as they do not require you to pass an audition.

### Unikino

What: cinema

Exp. required: none

Commitment (semester): once a week + 1-3 movie nights

Language: German would be helpful

Shows: within semester, during the week

Contact: ask staff at movie nights

Mail: team@unikino-goettingen.de



© Unikino Göttingen

## Unimusik (choir & orchestra)

What: orchestra and choir

Exp. required: singing or instrument skills, experience with a choir or orchestra

Commitment: once a week + one weekend + concerts

Language: German but English is ok

Shows: end of semester

Contact: meeting/audition start of semester

[www.unimusik-goettingen.de](http://www.unimusik-goettingen.de)



© Unimusik Göttingen

Just check out each introductory meeting at the beginning of the semester or visit a concert and you will see which group fits you. If two choirs are not enough for you, there are more in Göttingen. Have a look at the website [www.choere.de](http://www.choere.de).

At the ThOP or Die Blauen Sänger, you can stand on a theater stage. It is a wonderful experience to act on stage and learn how theater works. Besides acting, you can learn and get involved in light engineering, make-up, choreography,

set design or assisting the director. There is no prior experience required. Instead you gain experience on the job. Although not required, the ThOP offers various courses for acting or off-stage jobs. However, such courses might be difficult to fit into a graduate student schedule. If stage acting is the only thing you are interested in, you might also consider improvisational theater. Visit the introductory evening of the ThOP at the beginning of each semester and you will learn about upcoming plays, courses, improvisational theater groups and other related activities.

At the Unikino, you do not make your own movie but your own cinema. It is a group of students who express their passion about movies by providing cheap access to blockbusters and non-mainstream movies. If you are interested, visit a movie night and talk to the organisers.

All those organisations are for students. However, „student“ means all students and not only graduate students. Since there are more undergraduate students in Göttingen, those organisations are structured with an undergraduate time schedule in mind. The expected workload is usually low enough to be managed along a busy university schedule. Also, rehearsals and meetings are scheduled in the evening and occasionally on the weekend. Most organisations expect one meeting a week. This is great for hard-working graduate students. Only when being close to a show, the workload can increase substantially, especially for a theater play. When being part of a play, a choir or an orchestra, keep in mind that you usually commit for a full semester. In most cases, rehearsals start in the beginning of the

semester and shows are at the end. The ThOP presents plays during the entire year but the directors look for a new cast at an info evening in the beginning of each semester.

Since those groups are also managed by students, at least to a certain degree, there is plenty to organise beyond the rehearsals, shows and meetings. Shows need to be advertised, rehearsal weekends need to be planned, the press needs to be informed, social media needs to be up-to-date and so on. You can spend an enormous amount of time and effort, however, it is not expected or only expected to reasonable

## Theater im OP

What: theater

Exp. required: none, only for some jobs (e.g. directing)

Commitment: varying, can be substantial before the show

Language: EDW in English; otherwise German, English ok for off-stage work and small roles

Shows: new play each month

Contact: info-evening start of semester

[www.thop.uni-goettingen.de](http://www.thop.uni-goettingen.de)



© Ulf Janitschke/Theater im OP

## Die Blauen Sanger

What: orchestra, choir, big band and theater

Exp. required: none, basic skills are helpful

Commitment: once a week + one weekend + concerts/shows

Language: German but English is ok

Shows: end of semester

Contact: rehearsals start with semester, no auditions



© Die Blauen Sanger

[www.blauesaenger.de](http://www.blauesaenger.de)

degree. But maybe you like to organise events and do public relations. Each group will welcome you with open arms if you want to contribute to the organisational workload.

Also, keep in mind that as a graduate student you are rather at the upper end of the age range. This is not a big deal and might not always be the case, but it can happen that you find yourself among a bunch of 20-year-olds for better or worse.

What can be a problem, however, is language. Communication is in German. You will always find enough people who speak English and translate. All organisations told us that they are happy to accept non-German speakers. Only the Unikino recommended German skills. In the choirs and orchestras, it is not uncommon that international students take part. For stage acting, it is obviously more difficult, but even there, you would not be the first. If you want to participate, do not let the language barrier stop you. However, it will make your life easier if you understand German. The exception is the English Drama Workshop (EDW). Once a year, usually during spring, they perform an English play at the ThOP. Rehearsals, audition

and further communication is in English.

Long story short, you could use your time during the PhD to try something new and be creative. Your lab, GGNB and the science community offers enough options to keep you busy. However, you do not have to dedicate your whole time to science. No matter if you are enthusiastic about movies, theater or music, you will find like-minded groups in the Gottingen students' environment.

We thank Barbara Korte from „Theater im OP“, Jens Wortmann from „Unimusik“, Tamara Bartels from „Die Blauen Sanger“, Jasmin Pape from „Akademische Orchestervereinigung“ and Patrick Prahl from „Unikino“ for the kind correspondence.

### That's it?

No, there are many more opportunities in Gottingen. There are more choirs and improvisational theater groups. You could participate in a science slam or poetry slam. There are plenty of different sports you can try at the university sport center. Have you ever tried fencing,

for example? And of course, the „GGNB Times“ is always an option for you to gain some journalistic experience.

## Akademische Orchestervereinigung

What: orchestra

Exp. required: good instrument skills

Commitment (semester): once a week + two weekends + concerts

Language: German but English is ok

Shows: end of semester

Contact: audition at start of semester

[www.aov-goettingen.de](http://www.aov-goettingen.de)



© Akademische Orchestervereinigung Gottingen

# The Lumière cinema – “Where different movies are shown differently”

## Interview with Wilfried Arnold

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The Lumière cinema (named after the Lumière brothers - the founders of the cinema) is a place where “different movies are shown differently”. Located in the Geismarlandstraße, this cinema not only shows culturally valuable movies, but also organises and hosts a plethora of other events. We had the chance to speak to one of the founders and today’s head of the cinema, Wilfried Arnold, who told us what the Lumière stands for and which events we definitely shouldn’t miss.

### **1. As a short introduction to the Lumière Cinema – Who founded it and when?**

1980 a group of about 80 people, including me, founded a so-called “Filmclub” with the aim to create an alternative platform to promote movies apart from the big movie theaters.

We started as a non-profit initiative, “Film- und Kino-Initiative Göttingen“, “Movie- and Cinema Initiative Göttingen”, organizing festivals and events to promote movies in Göttingen’s cultural scene. It resulted in the opening of the Lumière cinema at the known location in the Geismarlandstraße in 1986. The still existing “Theaterkeller” reminds of those days, when this house had been the home of the “Junges Theater” in Göttingen. Today, the Lumière cinema, with its

50,000 visitors per year has earned a place amongst the most important cultural institutions in the city.

### **2. What is the “mission” of the Lumière Cinema?**

The longstanding mission of the Lumière Cinema is to “show different movies differently”. In the beginning, we wanted to be more independent from the university in order to have a broader impact on the cultural scene in Göttingen. We had the aim to give the municipal cinema a real cultural value that would put movies in line with theaters and other institutions. We started to promote movies as a collective cultural good, which included arthouse movies with a deeper cultural substance since mainstream movie theaters, showing mostly productions from the US, left no space for European contributions.

Today this mission is still persisting. We aim not only at showing movies but also at keeping the discussions and interactions with other institutions vivid. This year, for example, we showed movies in cooperation with the planned Scientific Museum of the University (the Forum Wissen) or Viva con Agua Göttingen.

### **3. What is so different about the Lumière Cinema compared to other cinemas? Why is it interesting and important for the inter-**

### **national community in Göttingen?**

Usually, a team of five people selects the movies that will be shown in the Lumière. Apart from a weekly choice, movie festivals give us further inspiration.

The international community profits from the fact that we choose arthouse movies from a range of different countries all over the world, including not only European countries, but also Iran or Japan, for example. We show these movies in their original languages with German subtitles, although we lay great emphasis on not only highlighting the language aspect but also try to focus on the cultural diversity of different countries.

### **5. Apart from the movies, what does the Lumière offer?**

There are two events to mention. The “Kinderkino” (“children’s cinema”) and the „Impro Show“. The Lumière does not itself organise these events but provides the space for artists to showcase their art. The “Kinderkino” offers a broad range of movies especially for kids. The Impro Show has a unique format where the audience gives instructions to a group of professional actors and thus shapes the play. It takes place once a month.

**6. Every year, several film festivals are hosted here in Göttingen. Can you tell us a bit more about them?**

We host four festivals each year in Göttingen. First is the Children's Movie Festival. The second one the Silent Movie Festival, at which we show silent movies and classics accompanied by live piano music. During the summer months, we organise the Open Air Film Festival at the Brauweg. Every Thursday, Friday and Saturday movies ranging from arthouse to arthouse/mainstream create a unique and easy summer atmosphere. The fourth festival is usually held in autumn – the European movie festival. Every year, we put another European country and its productions into the focus of this festival. This year, hosted from 23rd of November to 2nd of December 2018, French movies will be screened for a week accompanied

by exciting discussions with directors and exhibitions.

**7. Do you have a favorite movie or any recommendations for movies we must watch this year?**

This is a tricky question for me to answer, and I may not be able to tell you what my personal favorite movie is. However, I can certainly give you three recommendations of current movies worth watching.

First, there is "Weit" ("Far"), which is actually more of a cinematic protocol than a movie. A young German couple documents their travel hitchhiking around the world, by foot, ship, and train. It was initially not targeted towards a bigger audience, however, with 450,000 cinema-goers, "Weit" was one of the most successful movies in the last year in Germany. I like it because it conveys a positive outlook on exploring the foreign parts

of the world and is a reminder of the beauty of diversity.

Second, I recommend the movie "Loving Vincent", a biographical picture on the life of the renowned painter, Vincent van Gogh. It is a feature film, which was painted over by more than 100 painters in the style of the artist himself. It's a movie that I think is especially nice to watch in today's digital and quick world, as it is quite different from everything that we have seen so far.

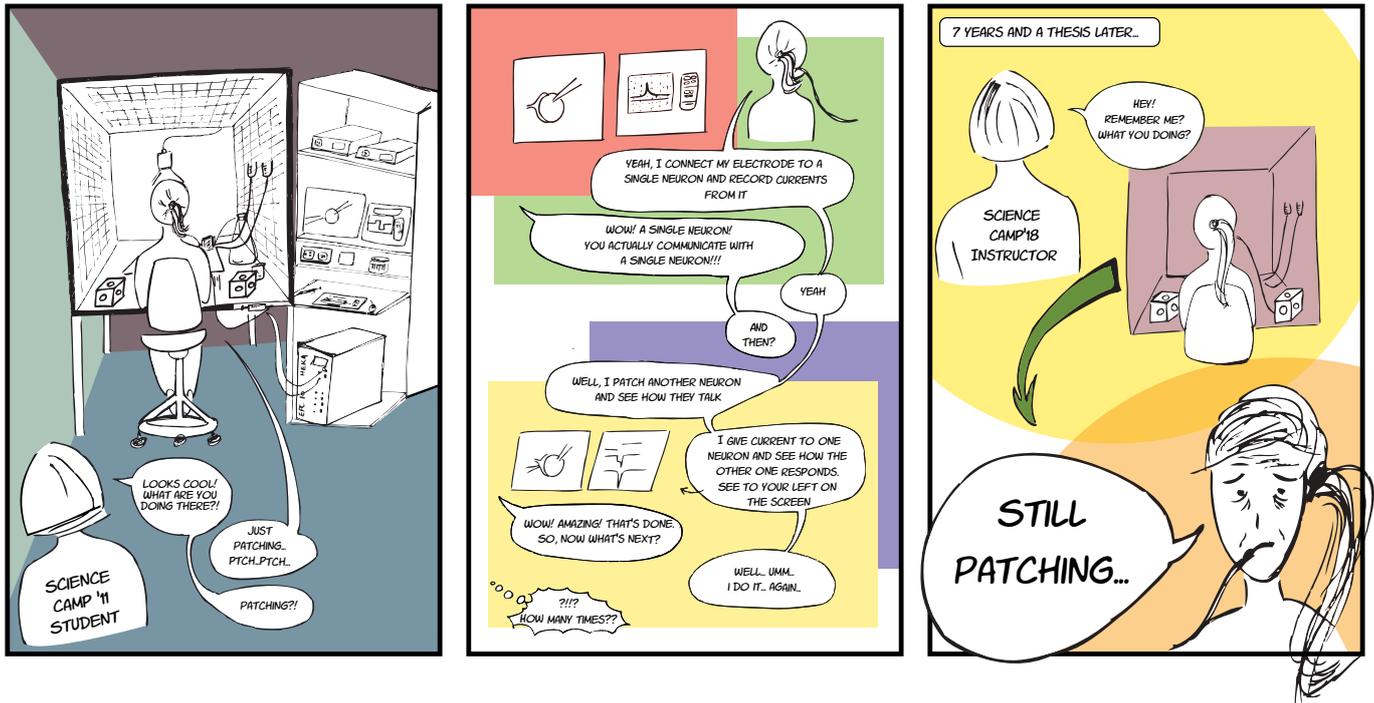
The third movie I would like to mention is the movie "Djam", a sort of "Greek road movie". Spanning topics like the Greek financial crisis and the ongoing refugee crisis, it still keeps the Greek way of living, thanks to the great soundtrack of the film. All of the above-mentioned movies were shown during the Open Air Festival.



The Open Air Cinema at Brauweg © Lumière cinema Göttingen

# Still Patching...

Tanvi Butola



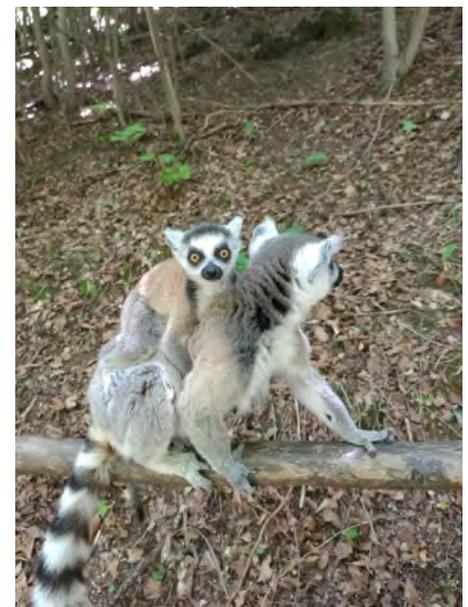
# Into the wild

Arindam Ghosh & Elisa Buchberge

Are you looking for nice places for hanging out, barbeque parties and nature walks? Well, the good news is that the city of science does not disappoint you. It not only offers an excellent atmosphere for scientific research and higher education, but is also blessed with some beautiful destinations nearby where you can relax, walk or hike and cherish the nature. This informative short piece will provide you with some useful information about some of these locations.

A ride of approximately one hour eastwards will lead you to a very special place – the “Affenwald” (“monkey’s woods”) in Straussberg, close to Nordhausen. Located in the woods of Thuringia, this place is definitely more than a common zoo.

While wandering around the park, you’ll meet Ring-tailed Lemurs, Barbary apes, Ruffed Lemurs, even a Wallaby and a few goats. The fascinating and fun thing is that you won’t watch the animals through a fence or glass, but the primates are moving around freely throughout the whole area uncaged. You might find yourself surrounded by a whole lot of lemurs at some point! Since the animals are used to humans, one of them might climb up your shoulder. A few meters further you might find yourself sitting and watching the Barbary apes enjoying their food, playing and quarrelling. While strolling through the area you will encounter the close relationship between the animals and the animal keepers who are also up for



Affenwald © Elisa Buchberger

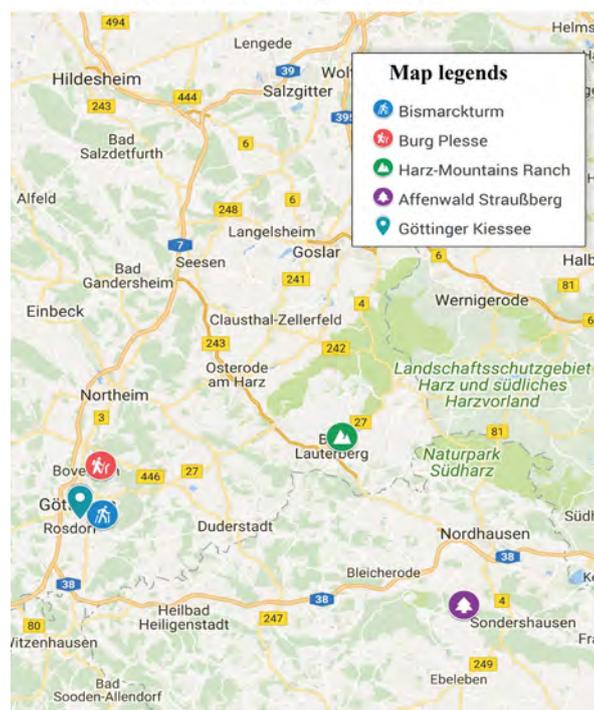
answering questions, if their time schedule allows it. The Affenwald does not only provide home to these animals but is also actively involved in species

conservation. So, visiting this place on a warm summer day will not only be informative, but the little, cheeky monkeys will for sure brighten up your day.

The mountain ranges of the Harz offer a beautiful landscape and are a popular and must-visit destination. The highest elevations of Northern Germany spread across Lower Saxony, Saxony-Anhalt and Thuringia, rendering extensive possibilities of walking, hiking, trekking, skiing and a number of other winter sports. You can take a regional train (for free if you are a student) from Göttingen to the edge of the Harz (get off at Goslar/Bad Harzburg) and walk from there or take buses deeper into the Harz mountains (Osterode/Herzberg/Bad Lauterberg/Goslar/Bad Harzburg). Also, there are nice multi-day trails that are marked and can be section-walked - for example, the well known „Hexenstieg“ (best entrance point in Osterode) and „Baudensteig“ (best entrance in Bad Lauterberg). The highest mountain peak in the Harz is the Brocken where one can enjoy the eye-soothing view of the landscape. In order to reach there, you can take a bus e.g. to Braunlage/Torfhaus, and walk from there. There is also a local steam locomotive going up the Brocken there if you don't feel like hiking/walking. As an add-on, all throughout the Harz, at 222 different spots, stamps are distributed that can be collected, which makes for worthwhile hiking tours. Destinations of stamps and information about stamp books can be found here: <http://www.harzer-wander-nadel.de/stempelstellen/uebersichtskarte/>

Another nice place to hang out on a non-rainy day is the Bismarckturm or Bismarck Tower, which overlooks the Göttingen and surrounding villages. Built in the last decade of the 19th century to honour Germany's first Chancellor, the tower offers a picturesque view of the mountain plateau and a short hiking trail through the forest on its way. One can take bus 71/72/73 to bus stop „Guldenhagen“ and walk from there. There is also an alternative longer route where you need to get down at Wagnerstraße (bus 50) and then walk through Schillerwiesen. If you are particularly interested in walking and hiking trips, the city of science has to offer the Burg Plesse or Plesse castle, located north of the town, close to Bovenden. The castle can be reached either walking from the Nordcampus, which is a 4 hours return trip or by bike, which takes 1.5 – 2 hours. Another alternative route is biking to Eddigehausen, and walking the rest, but the way can be a bit steep for some and exciting for the brave-hearted. The Kiessee is a lake situated south-west from the city centre. The shoreline, which is about 2.5 km long, makes a nice destination for walking, jogging, Nordic walking and fishing. It also hosts two playgrounds for children, a rental of pedal boats and rowing boats, a restaurant and a cafe. In winter, when the water surface is frozen, there is also the possibility of ice-skating. The lake can be best accessed by bike.

### Into the wild - Map directions



Map Data © 2018 GeoBasis-DE/BKG (© 2009), Google

Apart from these suggestions, a number of small parks are worth visiting. The botanical garden or the Botanischer Garten located near the city center is a pleasant place to be amidst nature. The garden attracted a huge queue recently when a titan sprout flowered for the first time in Göttingen, the time-lapse recording of which was published on Youtube recently. The Cheltenham-Park, named after Göttingen's twin town Cheltenham, hosts nice sunbathing lawns, a playground for children, a pond and huge shady trees inviting you to spend some time there.

To conclude, these places, in the true sense, offer great opportunities to be close to nature, which a "Göttinger" definitely needs to explore during his/her stay in this beautiful town.

# Humans of Science

Compiled by Michael Berger



photo: Julia Uraji

*"I taught myself how to play the guitar when I was a child."*



photo: Julia Uraji

*"I like to explore the cities around the globe with my camera."*



photo: Matthias Drolet

*"Currently I am preparing for my fourth marathon in Rotterdam."*



photo: Marina Sinner

*"Horses are my greatest hobby."*



photo: Julia Uraji

*"I think Metal, like science, is like a universal language."*



photo: Julia Uraji

*"My favorite reading place in Göttingen is the SUB Tower."*

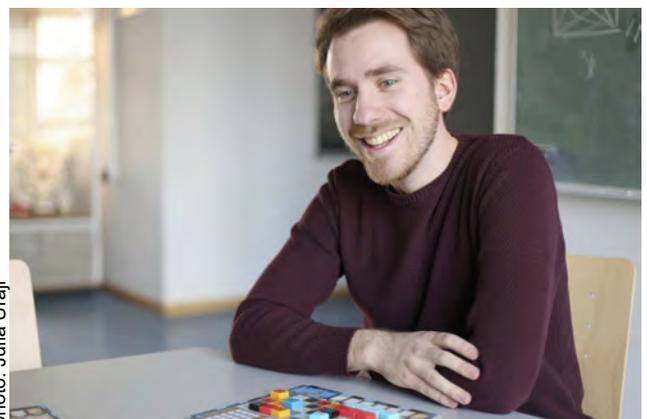
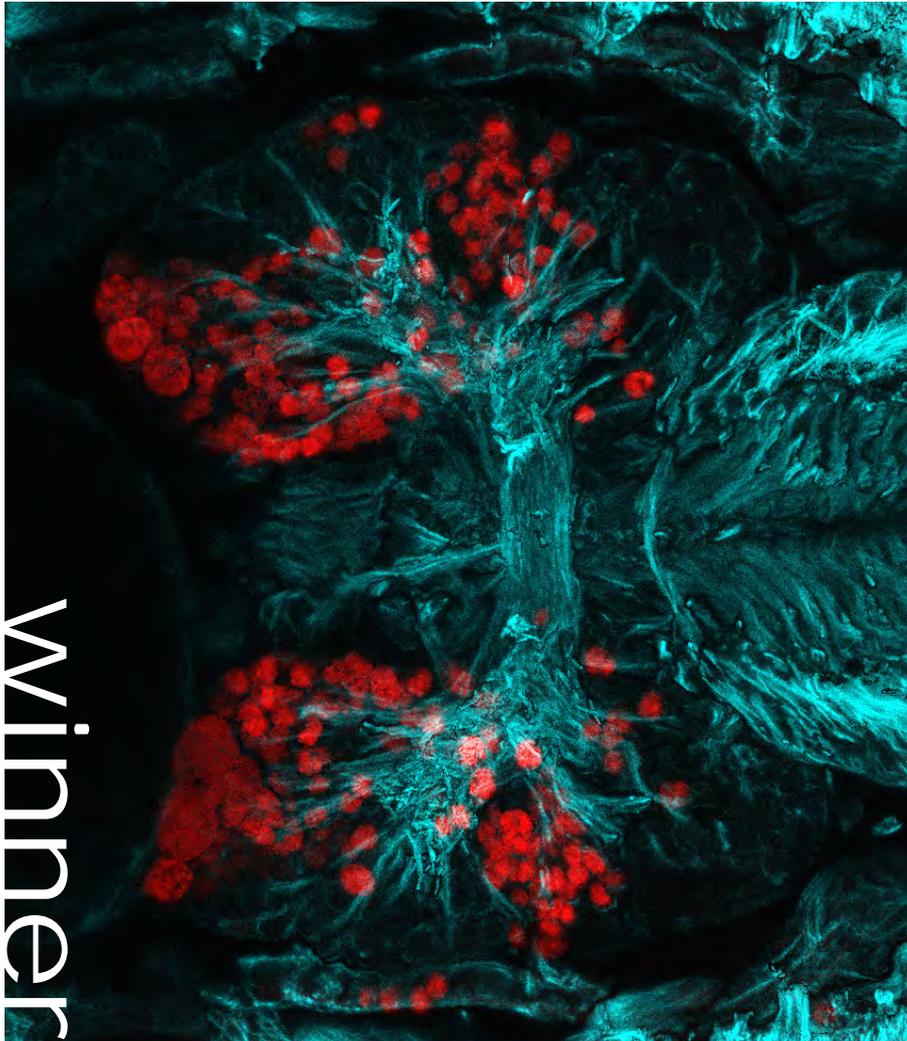


photo: Julia Uraji

*"I like to play board games with friends to socialize outside of work."*

Humans of Science is an initiative from March for Science Göttingen to show how Göttingen scientists really look like. Visit [marchforsciencegoe.de/hos-goettingen/](http://marchforsciencegoe.de/hos-goettingen/) to learn more and take part.



winner

**Max Farnworth** Shown here is the brain of a late-stage *Drosophila* embryo, stained with antibodies against acetylated tubulin in cyan and Rx in red (stack-projection by smooth manifold extension). I find the arborizations of the brain's fascicles in cyan particularly beautiful, which are reminiscent of a lung, rather than a *Drosophila* embryonic brain. The staining in red conveys first, that along with stainings of other developmental genes, you can generate an unambiguous expression atlas for each brain cell. Second, you can see the substantially bigger nuclei of delaminating neuroblasts to the left, which adds another level of information to the picture.

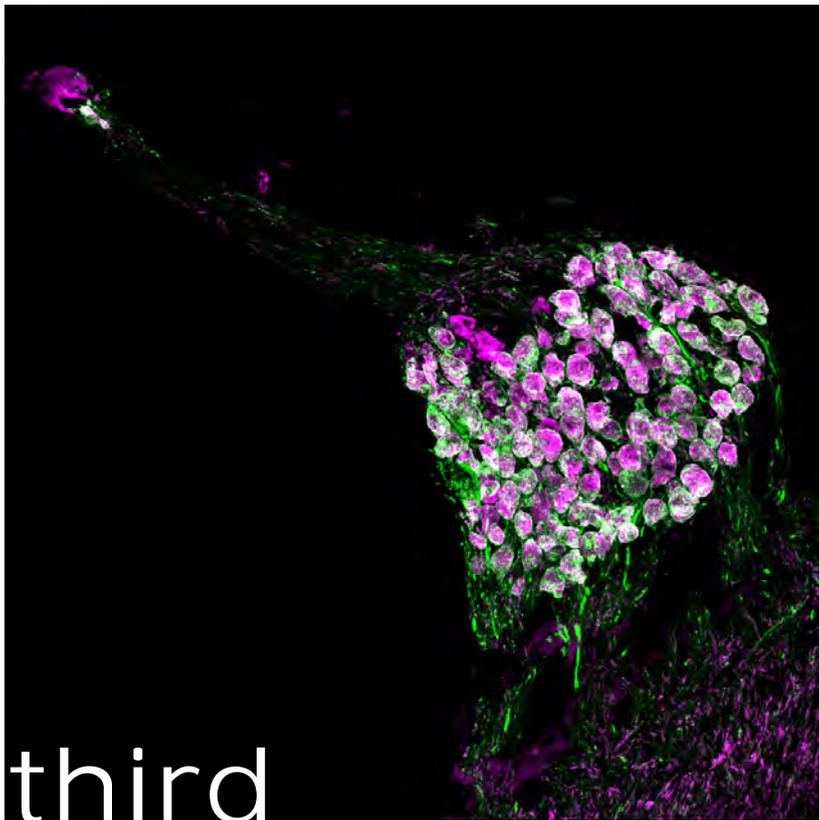


second

**Martin Meschkat** Life of a Phd: Love, Pain and Goldfish

Forms and faces appearing in the electron microscope. These are electron microscopic images of a cross section of a mouse optic nerve. The darker multilamellar structures are myelin, which wraps and insulates axons. In the axons, mitochondria (eyes) and a multivesicular body (mouth of the fish) are visible.

# Photo contest



**David Lopez** This image shows a cryosection of the apical spiral ganglion from a mouse expressing an opsin fusion protein (f-Chrimson-YFP, green) that enables red-shifted optogenetic stimulation of the auditory nerve. Spiral ganglion neurons can be identified by parvalbumin immunolabelling (magenta) and their spherical somata packed between one peripheral and one central process per cell. The peripheral bundle contacts an inner hair cell (magenta, top-left), while the central bundle spirals out of the cochlea and forms the auditory nerve.

The winner received  
a Nikon Coolpix  
W100 kindly  
donated by Nikon



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