

NEUROSCIENCE NEWSLETTER

Georg-August-Universität Göttingen · International Max Planck Research School



The Neuroscience Program...

When COVID-19 Becomes a Marginal Note

Welcome to the 9th Neuro-Newsletter of the Göttingen International MSc/PhD/MD-PhD Program and the International Max Planck Research School (IMPRS) Neurosciences!

When the last newsletter editorial was issued in 2021, twelve months into the COVID-19 crisis, I thought we had seen it all. The message concluded with an optimistic outlook towards “lively lectures, courses, and retreats”. There is no way to euphemise: A terrible misjudgement! Not only were our expectations regarding the Corona-pandemic completely wrong, we are now in a situation that renders even pandemics mere marginalia. A horrific and evil Russian attack on Ukraine has changed the world, with far-reaching and long-term consequences for our life in Europe. This is not a good basis for an editorial of a student

newsletter ... there is no way to continue with business as usual.

But is our Neuroscience Program business as usual? I think not! Our mission is to prepare young people from all over the world for a career in science. And science is one of the very few unifying enterprises in the world. It can transcend barriers of language, customs, ideology, or belief, and it has the power to transform the world and make it a better place. Our student community has shown this time and again, by forging life-long friendships between people that initially may have had very little in common - based on common values and the principles of testable hypotheses, experimental evidence, and concluding theories. And by spreading all over the world to explore the unknown on their own, fighting ‘alternative facts’ and toxic disinformation.

CONTENT

Editorial	1
Uncovering the neural mechanisms.....	2
Ca ²⁺ -permeable AMPA receptors.....	4
Isometric agonist.....	5
Master's class 2021/22.....	6
PhD projects started in 2021/22	7
The Masters of 2021	8
The Doctors of 2021/22	9
Alumni Juan Daniel Flórez Weidinger.....	10
Alumni Burak Gür	12
Alumna Nidhi Subhashini	14
Alumna Tanvi Butola	16
Alumna Monika Chanu Chongtham	21
2021 = 2* M.Sc. Graduation + Commencement.....	23
Neuro PhD retreat: a global journey.....	26
The first-ever Neuros Master's retreat	28
Current Faculty Members	30

This is why we must and will remain enthusiastic about our endeavour and assertive in our pursuit, particularly in these times of turmoil. Fortunately, we have become very skilled in running a graduate program during a pandemic - from student selection via dozens of online knowledge tests to thesis defenses via Zoom. We will maintain a solid level of caution wherever necessary, but we can expect relaxations of anti-pandemic measures as the year progresses. And mark my words: We will have a retreat in persona this year, in a PCR-verified COVID-free bubble if needed!

So, dear colleagues and students, let's stay confident! We are here in a privileged position and part of a program that makes sense and deserves our commitment, even though many of our certainties have literally been shot to pieces. We are in very difficult times. Let's use the unifying power of science to deal with them.

Nils Brose



Uncovering the neural mechanisms...

...of decision confidence by *Laura Geurts*

Confidence is a key component of almost all decisions we make on a daily basis. For example, we only cross the street when convinced that we will safely make it to the other side; a radiologist who is unsure about the interpretation of an X-ray will request an additional scan; and we do not wave to someone in the distance unless we are quite certain that that person is our friend. But how does the brain compute the level of confidence in such decisions?

The evidence on which we base our decisions (e.g. an image that falls on your retina) is often consistent with

multiple scenarios. Consider the situation in Fig. 1a, for example. To decide whether it is safe to cross the road, you need to estimate how long it will take for the car to reach the crossing. The car might accelerate or slow down, however, such that there is a range of possible time values. Moreover, the reliability of visual information is lower in the dark (Fig. 1b), increasing this range of possible scenarios.

Bayesian theories of decision-making prescribe how to make statistically optimal decisions while accounting for such ambiguity in the evidence, and have been able to explain behavior across different types of decisions¹.

Under the Bayesian framework, confidence is defined as the probability that your choice is correct^{2,3} (i.e., the probability that you can safely cross the road). This implies that neuronal populations encode a probability distribution over possible interpretations of the evidence, instead of just a single 'best guess'. Translated back to the example in Fig. 1, this means that neural activity should reflect the probability of a range of possible time values, instead of just a single estimate. Importantly, confidence should reflect this range. In our recent work⁴, my collaborators and I set out to test this hypothesis in the human brain.

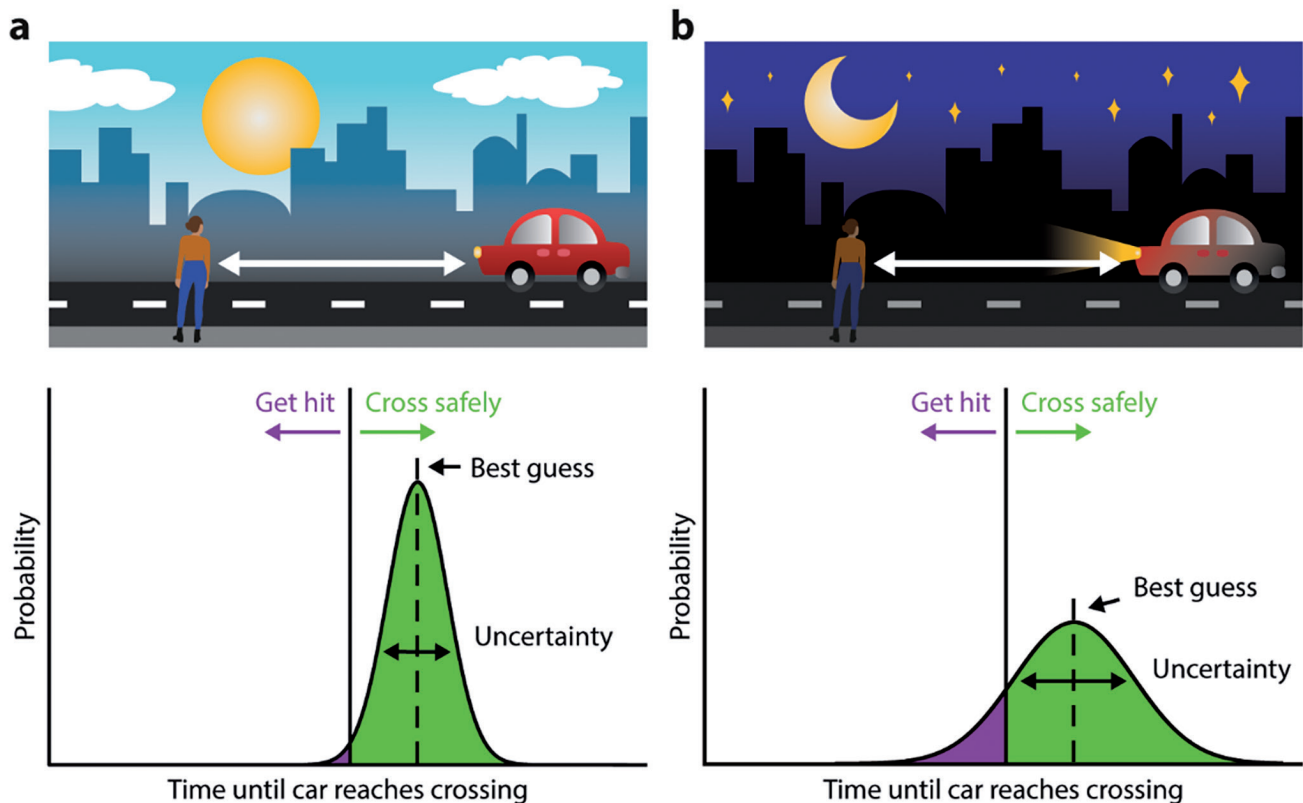


Fig. 1: (a) Your sensory evidence is consistent with multiple interpretations (time values on the x-axis), with different probabilities. The wider the probability distribution, the less precise the evidence is. The dashed line indicates your best guess of the time needed for the car to reach the crossing. The solid black line marks how long you need to cross the street. (b) Visual evidence tends to be less reliable in darkness, resulting in a wider probability distribution.

We presented images to participants in an MRI scanner, who subsequently reported what they had seen and rated their confidence about this judgment. Using a recently developed analysis technique^{5,6}, we read out the probability of the range of possible image interpretations from activation patterns in the visual cortex. This enabled us to measure the probability of different ‘scenarios’ as encoded in neural activity, and link this to the participants’ confidence reports.

We compared human data to simulated data from a Bayesian computational model, as well as alternative models in which confidence was based on simple cues, such as (in the

previous example) the number of cars on the road. Our participants’ behavior was consistent with the Bayesian model only. Most notably, the wider the range of plausible scenarios (as measured in cortex), the less confident participants were about their choices. Moreover, activity in areas associated with decision-making (insular, anterior cingulate, and prefrontal cortex) reflected both this range and the reported level of confidence, suggesting that these areas may be involved in the computation of confidence from a probability distribution encoded in neural activity.

Taken together, our findings support Bayesian theories of confidence and

suggest that feelings of confidence are based on a probability distribution over different scenarios.

References

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2. Meyniel, Sigman, & Mainen, *Neuron* 88, 78-92 (2015).
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4. Geurts, Cooke, van Bergen, & Jehee, *Nat. Hum. Behav.* 6, 294-305 (2022).
5. van Bergen, Ma, Pratte, & Jehee, *Nat. Neurosci.* 18, 1728-1730 (2015).
6. van Bergen & Jehee, *NeuroImage* 180, 78-87 (2018).

Laura GEURTS completed the IMPRS Master’s program in 2014 with a thesis in the lab of Melanie Wilke, followed by a second Master’s degree in Artificial Intelligence at Radboud University in 2016. In 2022 she will defend her doctoral thesis, based on the work she did in the lab of Janneke Jehee at the Donders Institute, where she currently still works as a postdoctoral researcher



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Ca²⁺-permeable AMPA receptors...

...set the threshold for retrieval of drug memories

Frequent relapse prevents the successful treatment of substance use disorders and is triggered in part by retrieval of drug-associated memories. Drug-conditioned behaviours in rodents are reinstated upon drug memory retrieval following re-exposure to cues previously associated with the drug, or the drug itself. Therapies based on mechanistic insights from rodent studies have focused on amnesic procedures of cue-drug associations but with so far limited success. Conversely, more

recent studies propose that inhibiting drug memory retrieval offers improved anti-relapse efficacy. However, mechanisms of memory retrieval are poorly understood. Here, we used a conditioned place preference (CPP) procedure in mice to investigate the cellular and molecular underpinnings of drug-induced memory retrieval. After extinction training of CPP, Ca²⁺-permeable AMPA receptors (CP-AMPA receptors) accumulated at drug-generated silent synapses of nucleus accumbens

(NAC) medium spiny neurons. The NAC CP-AMPA receptors regulated the retrieval mechanism of drug memories after extinction. Specifically, we used different priming doses of cocaine, fentanyl, or a cue associated with drug exposure to reinstate CPP, providing different memory retrieval conditions. Although both high and low doses of these two drugs induced CPP reinstatement, compromising CP-AMPA receptor accumulation impaired CPP reinstatement, induced by low doses of each drug or the cue. This threshold effect was mediated by NAC CP-AMPA receptors as region specific knock-down of PSD-95 prevented low-dose cocaine-induced retrieval selectively. These results demonstrate the NAC as a brain region and CP-AMPA receptors as key synaptic substrates that govern the threshold for drug-induced retrieval and behavioural expression of drug memories.

Full article: <https://www.nature.com/articles/s41380-022-01505-x?proof=t2019-6-6>

Author: Myrto Panopoulou et al
Publication: Molecular Psychiatry
Publisher: Springer Nature
Date: Mar 16, 2022



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Isometric agonist and antagonist ...

...muscle activation interacts differently with 140 Hz tACS aftereffects at different intensities

During transcranial electric stimulation, increasing intracellular Ca^{2+} levels beyond those needed for inducing long term potentiation (LTP) may collapse aftereffects. State-dependent plastic aftereffects are reduced when applied during muscle activation as compared with rest. Cortical surround inhibition by antagonistic muscle activation inhibits the center-innervated agonist. The objective of this study is to determine the interaction of state dependency of transcranial alternating current stimulation (tACS) aftereffects at rest and under activation of agonist and antagonist muscles during stimulation with different intensities. In 13 healthy participants, we measured motor-evoked potential (MEP) amplitudes before and after applying tACS at 140Hz over the motor cortex in nine single-blinded sessions using sham, 1 mA, and 2 mA stimulation intensities during rest and activation of agonist and antagonist muscles. During rest, only 1 mA tACS produced a significant MEP increase, whereas the 2 mA stimulation produced no significant MEP size shift. During agonist activation 1 mA did not induce MEP

changes; after 2 mA, first a decrease and later an increase of MEPs were observed. Antagonist activation under sham tACS led to an inhibition, which was restored to baseline by 1 and 2 mA tACS. Increasing stimulation intensity beyond 1 mA does not increase excitability, compatible with too strong intracellular Ca^{2+} increase. Antagonist innervation leads to MEP inhibition, supporting the concept of surround inhibition, which can be overcome by tACS at both intensities. During agonist innervation, a tACS dose-dependent

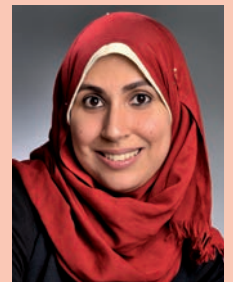
relationship exists. Our results integrate concepts of “leaky membranes” under activation, surround inhibition, intracellular Ca^{2+} increase, and their role in the aftereffects of tACS.

Full article: <https://doi.org/10.1152/jn.00065.2021>

Yasmine Rabah Shorafa, Islam Fawzy Halawa*, Manuel Hewitt, Michael A. Nitsche, Andrea Antal*, Walter Paulus
30 Jun 2021

Yasmine SHORAF (ABUDALU) did her Master work in the lab of Clinical Neurophysiology of Walter Paulus at the University Medical Center Göttingen. She works now as a doctor and does her specialization in internal medicine in Helios Klinikum Gifhorn.

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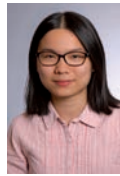
Students

Current

Master's class 2021/22



Namra Aamir
Pakistan, BSc from Lahore University of Management Sciences (LUMS), Pakistan



Thanh Thao Do
Vietnam, BSc from Georg-August-Universität Göttingen, Germany



Tejas Shaji Nair
India, BSc from SRM Institute of Science and Technology, India



Romy Aiken
USA, BSc from Florida State University, USA



Gökberk Günaydın
Turkey, BSc from Bogaziçi University, Turkey



Alba Milagros Navarro Flores
Peru, MD from Universidad Nacional Federico Villarreal, Peru



Cesar Mateo Bastidas Betancourt
Colombia, BSc from Universidad Nacional de Colombia, Colombia



Veronika Hantakova
Slovakia, MSc University of Aberdeen, United Kingdom



Elisa Panzeri
Italy, BSc from University of Leicester, United Kingdom



Leon Bösch
Germany, BSc from Georg-August-Universität Göttingen, Germany



Robert Haret
Romania, MD from Carol Davila University of Medicine and Pharmacy, Romania



Raquel Sofia Inácio Pinto
Portugal, MSc from University of Coimbra, Portugal



Uğur Coşkun
Turkey, BSc from Üsküdar University, Turkey



Princy Kakani
India, MSc from Dr. D. Y. Patil Vidyapeeth University, India



Sreedevi Raghu
India, MSc from Rheinische Friedrich-Wilhelms-Universität Bonn, Germany



Eren Diniz
Turkey, BSc from Bogaziçi University, Turkey



Ege Kingir
Turkey, BSc from Bogaziçi University, Turkey



Marina Saade
Brazil, MSc from Universidade de São Paulo, Brazil



Rebecca Divarco
USA, BSc from Grinnell College, USA



Donatus Krah
Ghana, BSc from Kwame Nkrumah University of Science and Technology, Ghana



Ekaterina Solyus
Russian Federation, BSc from Moscow State Lomonosov University, Russian Federation



Anna Celine Westhoff
Germany, BSc from Georg-August-Universität Göttingen, Germany

PhD projects started in 2021/22



Varsha Ramakrishna

Investigating visual coding by retinal ganglion cells in optogenetic models for vision restoration

*Tim Gollisch,
Jochen Staiger,
Tobias Moser*



Perianen Ramaswamy

Delving in the behavioural and neural correlates of pain perception using a therapy combining mindfulness meditation and transcranial direct current stimulation (tDCS) for the treatment of chronic pain patients

*Andrea Antal,
Melanie Wilke,
Frank Petzke*



Jaya Sowkyadha Sathiyamani

Subcortical control of visual processing and plasticity

*Siegrid Löwel,
Tim Gollisch,
Oliver Schlüter*



Applications 2022

In the year 2022, the Neuroscience program received 422 applications from 70 countries.

Germany 18
other Western Europe 14
Eastern Europe 17
North America 14
Central/South America 27

North Africa 21
Central/South Africa 27
Asia / Near East 106
Central Asia / Far East 178
Australia 0

The Masters of 2021

Hazim Abdelrahman

(A. Beyeler, external)

Role of anterior insula circuits in anxiety- and valence-related behaviors

Abdelrahman AIOkda

(M. Bähr / T. Döppner)

Examining *in vitro* stroke models: what you see is not always what you get

Pietro Amerio

(I. Kagan)

Neural correlates of spatial processing and saccadic free-choice in human intracranial recordings

Rachna Balaji

(A. Lampert, external)

Generation of an *in vitro* model for pain disorders: Using Nav1.7 HA-tagged hiPSC and patient-specific hiPSC-derived nociceptors

Laurin Büld

(B. Geurten)

The regulatory role of *nompC* in GR28b.d mediated thermotransduction

Bruno Carniatta Marques Garcia

(B. Carter)

Synaptic plasticity modulation by NMDA receptor antagonists

Avika Chopra

(T. Outeiro)

Stress granules formation in HEI-OC1 auditory cells and the mammalian organ of Corti

Hanna Dubrovskaja

(T. Dresbach / C. Dean)

Investigating the time-course of synapse formation in primary neuron cultures using GRASP

Yomna Gohar

(A. Flügel)

Role of Mechanotransduction in determining cell identity from stem cells to neurons

Paloma-Renata Huguet Rodriguez

(O. Schlüter)

Molecular mechanisms of retaining and retrieving cocaine-induced memories

Mariia Metelova

(A. Fischer)

Deciphering the role of m6A methylation of miRNA

Ranjit Pradhan

(A. Fischer)

Functional characterization of lncRNA 3222401L13Rik in Microglia

Varsha Ramakrishna

(T. Gollisch)

Temporal properties of retinal ganglion cells under light intensity changes in normal and optogenetically modified retina

Perianen Ramasawmy

(A. Antal)

Therapeutic effects of transcranial direct current stimulation combined with mindfulness meditation in fibromyalgia syndrome: a randomised placebo-controlled pilot clinical trial

Lucía Rojas Meza

(J. Rhee)

The Role of Munc13 in Dorsal Root Ganglion Neurons Neurotransmission

Hanna Rula

(T. Gollisch)

Spatial properties of retinal ganglion cells under light intensity changes in normal retinas and retinas expressing Opto-mGluR6

Jaya Sowkyadha Sathiyamani

(J. Clemens)

Role of auditory organ genes in variance adaptation in *Drosophila melanogaster*

Asude Tura

(R. Goya-Maldonado)

Working memory in patients with depression undergoing intermittent theta burst stimulation therapy

Alexandra Witt

(I. Kagan)

Perturbations of pulvino-cortical circuits in the context of goal-directed behaviour

The Doctors of 2021/22

**Tal Dankovich**

Recycling as a mechanism for extracellular matrix remodeling at the synapse
Silvio Rizzoli, Oliver Schlüter, André Fischer

**Ronja Markworth**

Signalling from Endosomes in Neurodevelopment and Neurodegenerative Disorders
Katja Burk, Silvio Rizzoli, Reinhard Jahn

**Sonja Pribicevic**

Kinetic analysis of neuronal SNARE protein interactions
Reinhard Jahn, Tobias Moser, Marina Rodnina

**Dimokratis Karamanlis**

How nonlinear processing shapes natural stimulus encoding in the retina
Tim Gollisch, Alexander Gail, Marion Silies

**Sebastian Molina Obando**

Mechanisms of robust feature extraction in early visual processing
Marion Silies, André Fiala, Tim Gollisch

**Nikoloz Sirmipilatzé**

Functional imaging of the anesthetized brain in primates and rodents
Susann Boretius, Jochen Staiger, Hansjörg Scherberger

**Madhura Ketkar**

Strategies for dynamic vision in the *Drosophila* peripheral visual system
Marion Silies, Tim Gollisch, Viola Priesemann

**Linda Olsthoorn**

Development of a versatile microfluidic platform to study the ionic mechanisms of vesicular neurotransmitter transporters
Reinhard Jahn, Tobias Moser, Ira Milosevic

**Heba Ali**

Role of novel Neurologin2-interacting proteins in amygdala fear and anxiety circuits
Dilja Krüger-Burg, Thomas Dresbach, Hannelore Ehrenreich

**Henry Klemp**

Establishing parameters for the characterization of rare neurometabolic and neurodegenerative diseases using mass-spectrometry based Metabolomics
André Fischer, Klaus-Armin Nave, Jutta Gärtner

You make the path as you walk

And 3 lessons I learned while walking by *Juan Daniel Flórez Weidinger*

Application letters are written in such a way that the next step is a culmination of a long-term plan, often starting with “since I was a child”. In reality, this cohesive narrative is a construct of retrospective, where all other alternative paths that you encountered are dismissed and often forgotten.

When I was in high school in Colombia, I had no idea that I was going to study physics. Shortly before graduating, it still didn't cross my mind to do a PhD in neuroscience in Germany. And after 4 years as postdoc, I was myself surprised when I ended up in Switzerland working for a bioinformatics com-

pany. But this doesn't mean that I was just randomly drifting with the current, waiting for destiny to write my fate.

Early in high school, I had the strong determination to become a medical doctor, so I initially enrolled in the medicine faculty. But already in the first semester I found learning by heart highly frustrating (even depressing), and realized that I was not enjoying my “since I was a child” plan. Physics came out as an attractive alternative that I found fascinating at school. The fact that most of the knowledge can be derived from a handful of formulas was definitely a plus. This unplanned ca-

reer path was a lot of fun and it made me travel across the globe, so I will call it a success. From this, I learned:

Be flexible - A detailed plan is good, but if you focus too much on it you might miss the warning signs.

My PhD work was in theoretical neuroscience, applying abstract mathematical models to understand self-organization in the brain. This definitely matched my training in physics. On the way, I came in frequent contact with different labs, discussing experiments and their interpretation. Out of these conversations, I ended up writing a lot of software to do the data analy-



Source: private

sis, becoming my main day-to-day task as a postdoc and leading me to explore deeper into analysis methods. When I was made aware of an industry job posting in Switzerland for a data analyst with strong modeling background, broad interdisciplinary interests and good communication skills (which I got from GGNB courses), I felt like my “since I was a child” story for the application letter would write itself. This taught me:

Keep a curious mind - The world is full of interesting topics worth learning about. One of them might end up defining your future.

Still this step was not easy. Even though I am in the R&D department, the industry mindset is different. There is less time to dig deeper into interesting problems or to look for alternative solutions. The “keep it profitable” maxim is unavoidable and key in decision-making. The pace and openness of the discussion with the pharma industry,

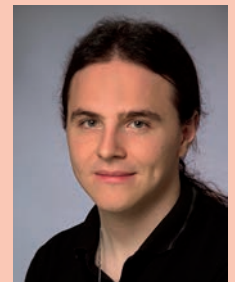
our main customers, is completely different as with collaborators in academia. And the scientific solution you provide is only a core wrapped in multiple corporate layers necessary to engrain it with the rest of the company. But at the same time, these constraints make each project unique, giving rise to challenges that I never had the chance to face before. With time, I am learning to optimize my work to navigate this process and at the same time develop a taste for the outer layers of my work. For me this means:

Life makes no loops - Appreciate the details that make each part of the path different and interesting, and use them as motivation to continue exploring.

The path continues. I am looking forward to meeting you somewhere along the way!

Juan Daniel FLÓREZ WEIDINGER

(Chepe) did his PhD and postdoctoral work in the group of Fred Wolf at the Max Planck Institute of Dynamics and Self-Organization. He is now a senior R&D scientist and scientific software developer at Genedata AG in Basel, Switzerland.



Science outside research:

sharing your knowledge for a fairer world *by Burak Gür*

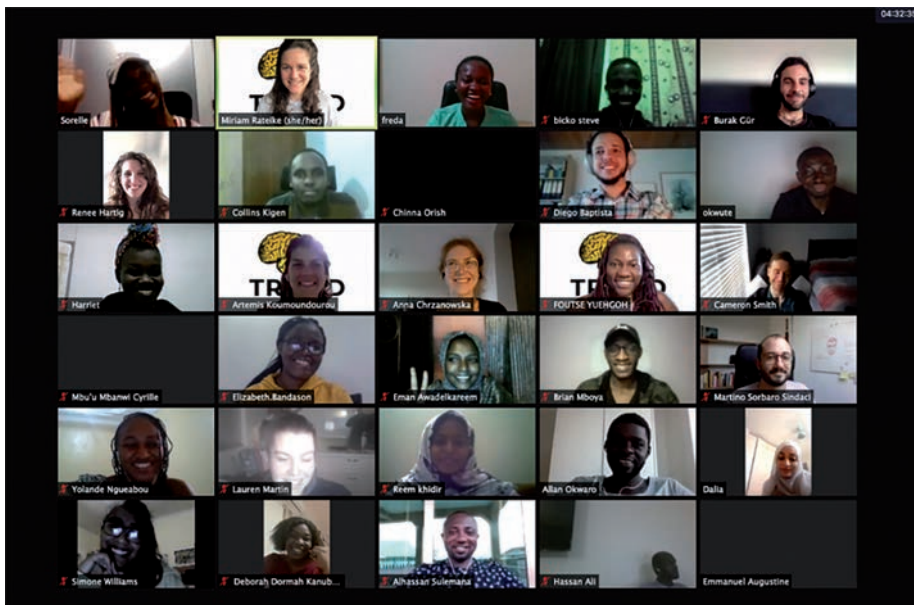
If IMPRS for Neurosciences was a program without the Masters funding, do you think you'd still be reading this? How common is it that bright people worldwide aspiring to become scientists, fulfill their desires, and get the high-quality education they want? Just think about your own country or the countries next to yours. Is it more com-

mon that people are rather stuck in obstacles of inequalities in various dimensions of life such as poverty, low access to high-quality education, societal pressure, prejudice, etc.? Even if they make it to a lab in a university, how likely is it that this lab has the means for having the necessary equipment or skills to perform "cutting-edge" scientific re-

search? For most of the world, including what we think is the "developed West" the answer is quite bothering. Deep down, most of us share a vision for making a positive impact. Isn't that, after all, one of the reasons we chose a science-related path? Of course, research provides a great way to do this.

solution? Is it realistic next to an ongoing Ph.D. work? During these self-questioning times, I stumbled upon a TED talk from a German neuroscientist based in the UK, Tom Baden. He co-founded the non-profit organization TReND in Africa¹, which supports science and scientists in Africa, where access to high-quality training and equipment is limited. I checked their website and saw that they needed volunteers for different types of work. I contacted them and found myself creating a Python programming course with like-minded volunteers for African scientists and students. This experience became one of the most rewarding of my life, and it only just took around 2 hours of weekly work. I met around 50 enthusiastic and bright scientists/students from Africa and had a fantastic experience. The cool thing about sharing your skills is that it doesn't work like a simple donation. It is not exhausted in a short amount of time. It multiplies by empowering these people to use these skills to improve their surroundings and further transfer them to their fellows.

Another such organization that I work in is Neuromatch Academy². They aim to "democratize neuroscience" and "bringing high-quality education to the entire globe". They bring the expensive, exclusive concept of high-quality summer schools accessible to everyone in the world with a working computer and a decent internet. So far, they have had people from 114 other countries with classes in more than ten different languages. It is a massive amount of work to make this happen. As you might imagine, they need all sorts of hands to make it possible.

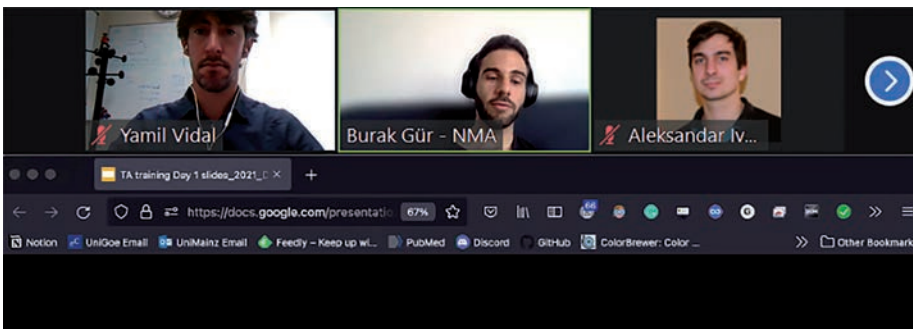


TReND in Africa supports African science through cutting-edge training and equipment donations. You can be involved in organizing online or on-site training, equipment donations, or doing some outreach. Here is a snippet from the end of a Python course. Source: private

mon that people are rather stuck in obstacles of inequalities in various dimensions of life such as poverty, low access to high-quality education, societal pressure, prejudice, etc.? Even if they make it to a lab in a university, how likely is it that this lab has the means for having the necessary equipment or skills to perform "cutting-edge" scientific re-

Still, research alone doesn't contribute much to solving some of the deeply rooted problems of science.

I often found myself asking: how could I have a positive impact in this problem? Which of my skills would be of use here? Am I good enough in anything to dare to be a tiny part of the



The Neuromatch Academy philosophy...

Deep Learning

- Which questions can we answer with Deep Learning? Why?
- What does it buy us? How do we get it right? How can we have intuitions in the face of complex models?
- Teach students to select and use state of the art deep learning approaches & how to see through the hype

Worldwide impact, inclusivity and equity

- Learn anywhere, provide access to excellent computational neuroscience education, and community building opportunities for every student regardless of location or financial means

TA Training

Week 0 11

Neuromatch Academy promotes diversity, equity and inclusiveness in science by bringing high-quality online summer schools all across the globe. Volunteers work on numerous ways to make the course possible: outreach, course design, fundraising, content creation, student and TA selections, tech, etc. Here is a snippet from a TA training session.

Source: private

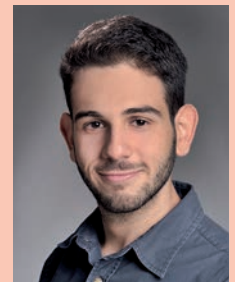
What are some of the valuable skills that you maybe take for granted? Are you good at programming? Perhaps you can design and execute complicated molecular biology work? Or you're good at communicating your work in different ways (articles, posters, presentations, etc.)? Maybe you are good at management and leading people? Whatever you think your skills are, people can benefit from them all around the world and you can share them with a couple of hours of weekly work. It is indeed an extra effort but it is definitely worth it.



- 1 <https://trendinafrica.org/>
- 2 <https://academy.neuromatch.io/>

Burak GÜR is a PhD candidate of the IMPRS Neurosciences and works in the lab of Marion Silies currently based at the University of Mainz.

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A German Path to Entrepreneurship

by Nidhi Subhashini

Academia or Industry? This most frequently asked question from grad students is soon to become a chicken-egg problem of our society. Without solving which is more important than the other, we should rather focus to keep the cycle going. To do so, is it worth to be bipolar in this debate? Owing to the credibility of younger generations, aforementioned are not the only de facto choices. Can the fresh graduates not create their own path? Is it not the goal of our education system to discover new paths or the new trails, which lead us to new destinations or even the same milestones with varied experiences?

Undeniably, for students, who have experience and network only in academia, industrial experience and environment feels very distant. In this tug of war between industry & academia, they however, forget that this bipolarity is blinding their vision. Each of us also have the ability to shape our ideas into successful business enterprises and offer professional solutions to the society.

“Although MPI focuses on basic research, I think there should be a conscious awareness that all this hard work is meant to, ultimately, improve humanity. The best way to achieve that is to bring ‘critical thinking’ into whichever professional area one decides to pursue. Hence, I believe more scientists are needed in all sectors of society including economics, politics, and entrepreneurship.”

Victor Bustos, Ph.D. (Alumnus IMPRS Molecular Biology, MPI; Co-founder and COO at Refoxy Pharma):

Yes! Let’s talk about entrepreneurship. And it is not daydreaming. It is also not blood and sweat. This is all about working together in a like-minded team of structural transparency towards a goal that is for advancement of society. Rest can be supported by the society. Here I touch on the German support system with focus on Göttingen area.

How entrepreneurship is assisted in Germany? The foundation of such subsistence comes in forms of networking and mentoring. For example:

– SNIC (Süd-Niedersachsen Innovations Campus) <https://snic.de/>

As part of SNIC, the universities of Southern Lower Saxony, city of Göttingen and several partners from the corporate provide an organised platform for knowledge transfer, networking and mentoring. Both the aspirants and the industries benefit from this program. The next level of encouragement is to finance the innovative ideas and there are regional platforms for that:

– Life Science Accelerator <https://www.gwg-online.de/startups/life-science-accelerator/>

Life Science Accelerator program is also part of SNIC in Southern Lower Saxony with direct focus on start-ups. It acts like a sandbox to the new players protecting them from injury when they fall down. Similar programs under same name are active in other states as well. Such platforms are actively supported by the Federated states, the Federal government, European Union and the corporate sector.

While the start-up -investor platforms can be a ‘dream come true’ experience for an aspiring entrepreneur, a start-up journey must not end with these sponsorships. There are also other ways to register a start-up like “1 Euro GmbH” which does not require big equities and the bureaucracy is friendlier. For an existing company in Germany, several grant opportunities are offered by the Federal government and the federated States to support mainly the small and medium scale enterprises. If a start-up has survived the initial years, further support can be achieved by applying to for instance:

– NBank by State of Niedersachsen <https://www.nbank.de/>

– RUBIN by the Federal Ministry of Education and Research <https://www.innovation-strukturwandel.de/>

Germany encourages and reinforces your ideas, innovations, skills and dreams to accomplish furtherance of socio-economic stature of mankind. People who choose to walk this path of entrepreneurship are also one of us:

“My PhD was the perfect jumping-off point for a career in health-tech and AI. During my Göttingen days, I grasped the value of interdisciplinary research, applying new methods to existing problems, and had the freedom to explore disciplines adjacent to my own. Learning presentation skills and to tell a story were also helpful in starting up a new venture.”
Dr. Pooja Rao (Alumna, IMPRS Neuroscience)

Finally yet importantly, infrastructure and ease of availability of resources is critical for existence and survival of young entrepreneurs. It is therefore advantageous to master plan the requirements of start-up right from the exordium. Have you already secured financial endorsements for your ideas but wonder about the equipment and workspace? Read more about the 'Life Science Factory', which offers state-of-the-art infrastructure support in the Natural Science sector and is custom tailored for Entrepreneurs!



<https://www.innovation-strukturwandel.de/strukturwandel/de/innovation-strukturwandel/rubin/rubin.html>



<https://www.gwg-online.de/startups/life-science-accelerator/>



<https://lifescience-factory.com/en/>

Nidhi SUBHASHINI graduated from IMPRS Neuroscience Program in 2017. After working as a Post-Doctoral Researcher at Institute of Neuroanatomy (UMG), she optimized her parental break to become an IPMA Certified Project Manager. Currently she works as Research and Development Manager at SERATEC GmbH, Göttingen.



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Going Wild

by *Tanvi Butola*

Postdoc is an exciting time, full of opportunities, challenges and new experiences. However, it can also be extremely isolating. If you choose to be in a new field of research, in a new city, in a new country, you may find yourself alone, in a new city, with no friend, and confused about cultural nuances. For example - it took me a while to understand that when people in America ask you “how are you doing?”, they don’t really want to know how you are doing. Instead they want you to say “Good. How are you?” and move on *sigh*.

As a PhD, you are well equipped to ace your scientific growth in your new chosen field. Even though you face intense competition to publish and progress, learning the science is actually the easy part. As a postdoc you are not just responsible for yourself but are expected to guide graduate students and at times colleagues. Everyone has their own expertise, priorities, and quirks. How do you lead your peers without bossing or offending them? How do you resolve conflict without sounding judgmental? How do you build a support network?

To answer these questions I chose the WILD way. The WILD (Women’s Intensive Leadership Development) program is, as the name suggests, a leadership development program for Women in STEM organized by the Postdoctoral Affairs Office at NYU. The most exciting part of it is that it is an outdoors leadership program. Over the course of a year, a group of women scientists learn leadership skills, conflict management, planning, logistics, and much more in the context of nature

and wilderness. The ultimate challenge of the program is to plan and execute a 143 mile (~230 km) thru-hike through the Adirondack Mountains over the course of ten days.

Now the obvious question is - how can hiking in the wilderness, disconnected from civilization and cellular signal, with nothing but your team and whatever you packed in your backpack, make you a better leader/ team player? I don’t know. But I learned a lot during my experience, and would like to share some of what I learned with you.

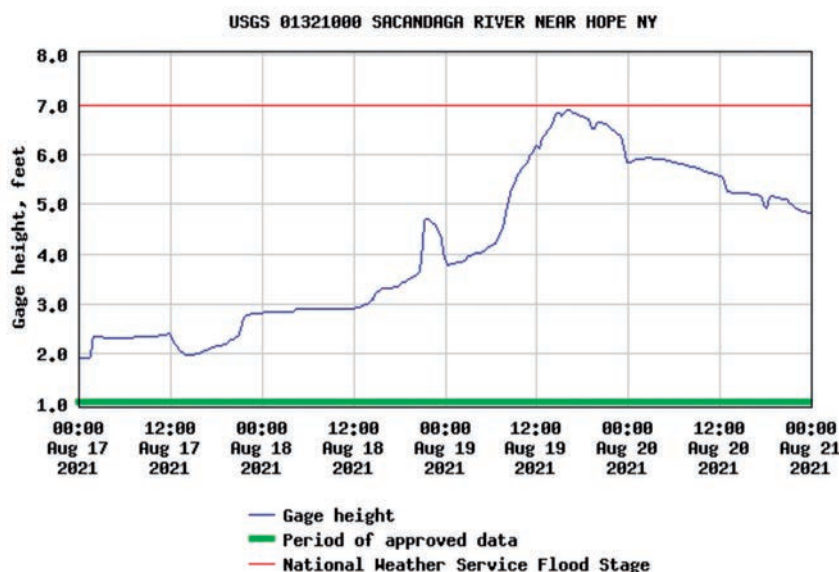
Lesson 1: Prepare well, plan but be flexible to accommodate the storm.

In early 2021, a year into the pandemic, I was in no shape or condition to hike 143 miles (averaging about 15 miles a day) with 30 pounds on my back, in intense heat and/or torrential rain. After the first practice hike, my

whole body ached. Muscles which I didn’t even know I had and certainly has never used before were sore for days. Two of my toenails turned black, and eventually fell off. I was completely unsure if I would be able to do the final hike; but this where I learned about preparedness.

Our team planned, organized and undertook several practice hikes, two overnight hikes, and many urban hikes across New York City (urban hikes = walking around town on unforgiving concrete in scorching heat with heavy backpacks). We had monthly planning meetings and rigorous weekly group training sessions over zoom. After each 90 minute training session I was absolutely destroyed. I have never worked this hard on myself physically.

After the last practice three-day hike in the wilderness and on my third pair of hiking boots, I returned home with no blisters, and very mildly sore muscles. That is when I knew I would physically be able to walk the distance. However,



the three consecutive days out in the woods brought up another challenge – the emotional and mental toll of spending ten days in the woods with no showers, toilets, fresh food, or a bed, away from your friends and loved ones, and constantly, closely surrounded by the same people every moment of the day...but more on that later.

We had split up the 143 miles into 11 stretches from Northville to the beautiful Lake Placid through the unpredictable, multi-terrain Adirondacks. For every leg of the hike, one person was the designated leader who planned the entire route – rest stops, water refills at lakes and ponds, campsites, and exit routes. In addition, we were actively monitoring the weather and other safety conditions leading up to the hike. August 19 2021, on the first day of our meticulously planned hike we were hit by hurricane Henri.

At the start of our hike, we had to cross a creek on foot which under normal conditions would have water that was ankle deep. The water level at this crossing was posted online and updated regularly. A gage height of 4 feet is the limit for safe crossing. August 19, at midnight the gage height read almost 5 feet. We decided to brave the crossing nonetheless so we could stick to our plan. However, by the time we reached the trailhead, the gage height had reached a high of 7 feet. (Note: at the time of this writing, 7 feet on August 19 2021, is still the highest water level recorded at that crossing). With the creek flooded, our months of planning were jettisoned within a few hours of starting the journey; that is, everyone's plans for every stretch of the hike had to be reworked at the last

minute. However, we did not panic. We got together as a team, discussed alternatives, and rerouting. In the end we decided to skip the first 12 miles of the hike, hitch a ride to a point further up after the treacherous creek crossing, and embark on our storm-drenched journey there. Armed with a map and compass, we decided to be more spontaneous and plan each day as it came. This ethic of course applies just as much at work or in one's personal life -- you can plan as much as you want, but ultimately you need to be prepared to change your plans to accommodate life's storms.

Lesson 2: Learning to lead your peers

Even though we evaded the flooding creek, the rain on that first day was merciless. As we entered the Adirondacks we were welcomed by a lush green trail, flanked by beautiful ferns and fallen logs covered in moss. However, amidst this natural beauty we were relentlessly attacked by the incessant rain. We came across another creek where the water-level reached just above the ankle. Crossing it on foot would have meant our waterproof boots would fill up with water. The problem with waterproof boots is that they keep water out but if water somehow gets inside it is very difficult to remove. On the first day of a 10 day hike, no one wanted to get water inside their waterproof boots. People wanted to avoid crossing the creek at all costs. I, on the other hand, started to worry about the daylight. We had started late in the day due to the flooding, it was getting dark and I was acutely aware of

the possibility that we might not reach the campsite before sunset. I was willing to risk wet boots if it meant avoiding having to walk in the dark. However, it was not my day to lead and I felt uncomfortable making the decision or offering my opinion too strongly.



The Trail

Source: private

I suggested we should try to save time and just risk getting our boots wet. There was a lot of confusion, but not much discussion. I started crossing the water and made it across in five minutes. Some of my teammates followed me but some others went off on their own. They finally found a long log that stretched across the water, on which they crawled to cross the creek. Their boots were spared but it cost us 30 minutes of daylight. The same creek meandered around to block our path once again with more intensified fury. The water was now up to our waists, and the current treacherously strong. Even with our 30 pound backpacks we would not have been heavy enough to hold our own in the water. This time it was getting dangerously dark. I didn't see any other visible crossing or a way around what lay ahead. Our only way across seemed to be through the water. However, this time I actually voiced my concerns and communicated with

my team. My discomfort stemmed from leading my peers, my equals. It took me a while to realize that if your team consists of people you consider equals, then you should also give them credit that they are also capable of assessing the situation as you do. If you would listen to their suggestions, why should you expect any less from them? After our brief pow-wow we were all in agreement and plunged in. With fear in our hearts, we formed an arm linked chain, and started inching sideways across the creek. I was the first one in at the extreme end of the chain because I felt responsible for leading us down this path. With the very first step we were at war with the water. But linked together, communicating about each step, and stones between which to step in the creek we made it through to continue our journey.

Lesson 3: Be cow-like

Even though we survived the creek and the wilderness the first day it did not stop raining for the next two days. Our waterproof boots were extremely good at their jobs. They retained all the water that had crept inside them. Walking in wet boots that now weighed twice as much, feet in wet socks that wouldn't dry, and bodies covered in wet clothes that froze you if you stopped walking, tensions ran high. It was bleak, and the dreadful question loomed over us 'will we last 10 days of this?'

This is when I learned how to be a cow. Just keep on moving, unreactive. There are no profound thoughts, there is no reservoir of fortitude that you can dive into, and come out inspired. No, some-

times when everything just pushes you down, seems beyond your control, and you just cannot go on, you just put one foot after the other, and wait for the frustration to subside or the clouds to part.

Lesson 4: Breaks are just as important

The clouds did part the next day, to which there was much relief and rejoicing. Tensions dissipated and everyone seemed friendlier. Then, some day-hikers who had joined the trail a few hours ago, warned us that the next day was the 'dump day', meaning it was going to rain harder than ever. It was supposed to start in the afternoon though so they recommended we start early and set up camp before the storm started. Everyone was exhausted and wanted to spend more time at the dry camp to rest their muscles and regenerate. However, we all also wanted to avoid another wet day. So despite our fatigue, we decided to wake up before the sun, pack up and be off early to set up camp 10 miles ahead. Motivated by the prospect of avoiding the rain we walked so fast that we covered the 10 miles in a little over three hours. It might not seem like a lot but with heavy backpacks, and walking in wet socks, shoes and clothes, it was a feat (excuse the pun)!

Since we had covered 10 miles in such a short time we contemplated walking ahead and not adding the six remaining miles to the next day. However, at that moment the sun was shining bright, we all had reached a beautiful campsite right by the lake. There was

even a double rainbow smiling down on us. Checking in with the group we unanimously agreed to set up camp there. We could have walked the other six miles, we could have mustered the energy and will power, but we all wanted the mental break.



Camp before the storm

Source: private



Preparing the lean-to for the storm

Source: private

We prepared our lean-to (wooden structures dispersed around hiking trails where one might seek shelter) for the storm by lining the open wall with tents, relaxed, and played games as we waited for the storm together.

This also marked a change in our group's priorities. We decided as a group that our goal was to enjoy the journey and for this we would like to have more time at camp. So we prioritized hiking extremely efficiently



Lean-to with our filtered water



Inside our lean-to pre-storm



One sunny day



Group stretching

Source: private

with very calculated breaks. This did not mean we did not enjoy the walk. We were surrounded by beauty and wondrous creatures, but as a group we wanted more leisure time at the camp. This was decided as a group and we all endeavored to support this goal. At camp when there was sun we dried our clothes, when there was a lake we would go swimming, when it was dark we would build a campfire!



We were talking about cats

Source: private



Campfire at the 'beach'

Source: private

Lesson 5: Break it down and trick yourself

After the storm we had a long day ahead of us because of the carry-on mileage from our storm shelter day. Walking 19 miles a day with an elevation gain of more than 1000 feet through marsh and rocks after days of doing the same is physically taxing and even more menacing mentally. When you wake up in your camp cold and achy, and think only of the final daunting goal (and the how far you are from it), your mind would defeat you before you even start. This is where we tricked our minds. We would divide our daily hike into 30 minute stretches. Every 30 minutes we would stop for a quick water break, and every third of these stops (so every 90 minutes) we would take a ten minute 'bags down' break. So instead of thinking we have 18, 17, 16... miles to go we would only have 30 minutes to walk until a short-term goal was accomplished and we got a water reward (yes, we were our own mice in this experiment). Anyone can walk just 30 minutes, right?

And just like that we walked 131 miles in 30 min stretches, one day a time. I undertook this amazing journey with five other women scientists. This was

one of the greatest things to come out of the dismal pandemic years. I learned a lot about group dynamics and team building, and gained myself a support system in my new city. However, the most important lesson I learnt was to remember to 'take care of yourself'. Yes, the team's success is the collective goal but that doesn't imply you ignore what bothers you – physically or mentally. If you don't function well, the team as a whole cannot. So if you need a break to attend to a new blister or adjust your backpack or if you just couldn't go on and needed a break you speak up, and the team supports you in that too.

Outside of the hike if you need help or a break, take it. Build an environment where your team realizes the importance of self-care and supports you while you work on yourself. After the pandemic lockdown, when the labs reopened I was in a frenzy. I turned into a drone, mechanically and aggressively collecting data for fear of another lockdown. The WILD program apart from a leadership guide was a much needed break for me to work on my physical and mental health. It brought me back to things I had been ignoring and needed to stay sane and productive. I started painting again during the hike. Every

Alumni Views



Scenes like this kept us going

Source: private

night before sleeping I would paint the day's highlights. After the final hike, I started running again spurred by my physical transformation for the hike. Since my WILD experience I have run three half-marathons and will run my first marathon at the end of April. The hike brought me back from my pan-

dem ic stupor and I hope I never fall into it again. The motivation for the WILD program comes from the National Outdoor Leadership School (NOLS) which strives to inculcate *Expedition Behavior* to 'keep the group moving together in good spirits, through good times and bad, planning but at the same time managing unexpected risks.' Expedition behavior as the NOLS founder Paul Petzoldt, defines it is 'an awareness and attention to all relationships that influence an outdoor experience'. Replace the word *outdoor* with what-

ever setting you wish to work in, and you have yourself a recipe for leadership, and team or life management.



Mischief managed!

Source: private



Tanvi BUTOLA did her Master's and PhD work in the lab of Tobias Moser at the Max Planck Institute for Biophysical Chemistry and University Medical Center Göttingen. Currently, she is a postdoctoral researcher in the lab of Jayeeta Basu (also an alumna of the IMPRS Neuroscience Program) at NYU School of Medicine in New York City. She would be happy to answer any questions one might have about introducing an outdoor leadership program at their institute.

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Stress no more, for Stresspunsch is here.

by Monika Chongtham

What?

Stresspunsch is an Instagram ideation of an interactive community to help spread awareness on mental illness, stress-resilience, and interesting brain facts. The delivery is made in the form of fun facts/insta reels/insta quiz etc., through a friendly but decisive and wise brain, as a mascot 😊.



How?

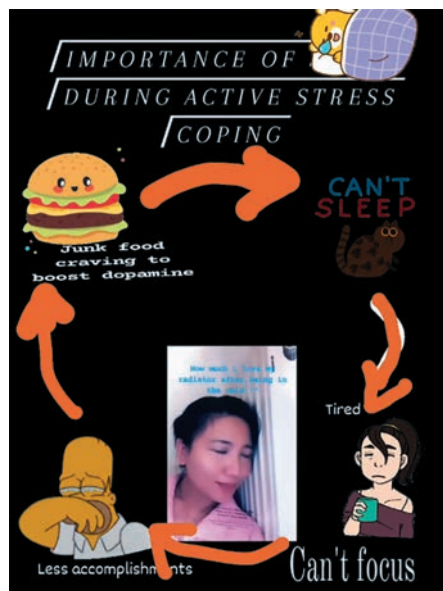
Promoting awareness to the non-scientific community could be done through our old methods of paper education/offline magazines. However, as we go more and more virtual, along with the rising popularity of social media, it is apt to transfer education to social media. Currently, Stresspunsch is termed as a community, to promote belongingness rather than strict education/therapy sessions. A lot of motivational quotes in Instagram has become popular. However, apt explanations of neurochemical mechanisms are still at large. Stresspunsch aims at filling up the gap.

Why?

The world has changed, drastically, in terms of lifestyles – sleep patterns, information processing, competitiveness, sensory stimulation, social bonding and eating habits. As a result, we are becoming more prone to suffering from depression, anxiety, post-traumatic stress disorders and other forms of mental illness. However, there is still a huge stigma associated with mental illness/depression etc., which hinders early treatment or choosing a healthy lifestyle, through prior information. Therefore, destigmatisation, through promotion of awareness, is essential.

Want a snapshot of what's in there?

Stresspunsch can be treated as a tool that simplifies complicated scientific information into palatable information. This is done through reels (short insta videos) of less than 10S, in-keeping with the short attention span of the current generation. Up-to-date music is played in the reel to capture attention and to make the learning more agreeable. Attached is a snapshot of the reel showing what happens under the domino effect of stress-no sleep-overeating cycle, with an adjoining write up.



SLEEP PARALYSIS IS CAUSED BY

- (A) Demonic presence
- (B) Dysregulation of brain and body wake signals
- (C) Dog barking at a distance

Figure: Snapshot of a reel from the Instagram page

Apart from the reels, 'do you know' posts as well as fun quizzes are delivered to explain several myths. For example, the existence of a neurochemical basis for sleep paralysis. Source: private

DEPRESSION IS DUE TO

- (A) Evil spirit
- (B) Imbalance in Neurochemicals



echelons.stresspunsch_101 4. Sleep and stress coping:

We know sleep is necessary. When we don't sleep well, we get tired the next day and lose motivation. By that time a neurochemical (dopamine) important for goal-oriented behaviour is already low. Because we are tired, we won't be able to achieve our daily set goals. This will make us feel sad and we will crave for more junk food. Most of these junk food contains mono sodium glutamate, which gives us a momentary boost. But at the end of the day, it can lead to sleep troubles and trigger the whole self-sustaining cycle. This is why most anti-anxiety pills, depression pills or pills for mental illness try to hack the sleep cycle. #sleep

How is it different from the other Neuroscience pages in Instagram?

Other pages use lengthy words for scientific communication and are delivered in the form of education channels. Stresspunsch is different in that it delivers the content through vivid visualisation aided on by a trending music. This is built to enhance information assimilation along with the comfort of belonging to a community. In short, it is a hybrid of motivation pages with scientific reasoning.

Current scenario and how to contribute towards propagating Stresspunsch.

Though the page was started to deliver simple information, it has also made us assess current public awareness. Answers to quiz questions reveal that much is needed in educating the common public about stress resilience. Now, we are 269 in this community.

Although Stresspunsch is still at its infancy, we look forward to a greater outreach through your support. The target audience is young adults, and teenagers, where most stress-coping strategies are developed/rearranged. We hope that influencing the young adults would help influence their future kids, too. Incorporating awareness at an early stage of the new generation will reduce the stigmatisation as well as help in making informed decisions of a healthy lifestyle.



The future lies in the youth. Mould young minds to be resilient, for they are the most plastic. Help Stresspunsch by increasing its visibility.

https://www.instagram.com/echelons.stresspunsch_101/?hl=en

<https://www.facebook.com/stresspunsch>



Monika Chanu CHONGTHAM (Creator of Stresspunsch)) joined the IMPRS Neurosciences in 2013. She did her Master's thesis in Prof. Gregor Eichele's lab (see doi.org/10.3389/fcell.2020.584314). During her studies in the Neuroscience Program, her interest in epigenetics behind individual differences in susceptibility to mental illness grew. She accepted a PhD position in the Leibniz Institute of Resilience Research to further cultivate her interest in this field. Currently, she is preparing her thesis submission on 'Deciphering the epigenetic mechanisms of stress and resilience' and aiming to propagate Stresspunsch to a larger audience.

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2021 = 2* M.Sc. Graduation + Commencement

by Perianen Ramasawmy

The most eagerly awaited event of each IMPRS year is indeed the graduation of the Neuro master's students paired with the commencement ceremony for the next generation of Neuros. Sadly, the graduation for the class of 2018 did not take place as planned in 2020 owing to the COVID-19 pandemic.

The 15th October 2021 marked a memorable event: the first ever-double graduation ceremony for the Neuro classes of 2018 and 2019. The organisational effort of Sandra, Jonas and Franziska together with student representatives led to a grandiose celebration in the magnificent hall of the Old Mensa at the Wilhelmsplatz in the Göttingen city centre.

Jonas kicked off the event by giving a hearty welcome to the new student cohort and graduates who were present both in person and in joining from around the world online. Prof. Martin Göpfert, the programme director gave a warm introductory speech, expounding on the meaning of the Master's degree and sharing tips with the new graduates on how to become great scientists. With the doctorate certificate of Albert Einstein awarded by the University of Zurich as the background for the conferment ceremony, Jonas and Sandra presented the diploma and a bouquet of flowers to each graduate. It was the first time in the history of the IMPRS Neuroscience programme that degrees were conferred to handcrafted wooden mannequins of students who could not make it to the event in person.

Andrew and Aditi, from the 2018 class, took everyone on a trip to relive the memories of the previous years.



Degree bestowal to Neuro 2018/2019 class.



Ranjit's mannequin was there to receive his diploma.

Afterwards, Krishna shared a retrospective of the master's years, reviving the journey undertaken by the 2019 class from their first day in Göttingen to the graduation day, spiced with hilarious

stories and embarrassing photos. Apart from celebrating the new milestone in the career of our graduates, it was also an opportunity to rejoice in our other achievements, such as surviving

Campus Events



MSc graduation speech by students Krishna, Andrew and Aditi.



Gratitude to the IMPRS Neuro coordination team: Sandra, Franziska (absent) and Jonas.

a freezing -23.1 °C winter, being the guinea pigs for online teaching due to COVID and, of course, developing lifelong friendships. One of the epic events of the year 2020 would have been the biggest annual culture night, the Indian Culture Night. Once again, due to the pandemic, this had to be cancelled despite the hard work of students from both Neuros and Molbios.

The graduation was an occasion to display the music and dance videos from the culture night rehearsals of our multitalented IMPRS students.

Then, the 2021 newbies took to the stage to introduce themselves and extending their best wishes with the graduates. A highlight of the ceremony was the rendition of a song composed

by Anushkha and Lucia, summarising our master's journey, with its vicissitudes over the last 1.5 years. To finish off the ceremonial part of the event, we showed our gratitude to our beloved program coordinators who have always been there to support us throughout our time in Germany through a personalised trophy.

Following the graduation ceremony, we all marched in a little parade from Wilhelmsplatz to Weender Landstraße. Walking around the city with our wooden mannequins definitely caught the attention of curious passers-by. After all, it was the evening of the Neuros. At the Hemingway bar, we quenched our hunger and thirst before setting the dance floor on fire. The after party reminded us that the flame of the party animals in the Neuro cohort did not die out despite the lack of culture nights. The memorable event ended in the hours of the early morning. The equation '2021 = 2* M.Sc. Graduation + Commencement' was a celebration of great memories, our success and many more wonderful years to come.



The Neuro MSc graduates of the 2019/2020 class

Song Text

Hey Lucia please stay with me
I'm just looking for a way to express that
I'm so happy to come and meet
All my friends and have fun as we used to have

You remember all the parties we had
At the culture nights and in your living room?
And Ranjit would always get something crashed
Please tell me he is now with us on zoom

And I saw a point in every point you've tried to
make

I'll remember every home made chocolate cake
And if one does, we all do
We just wanted to say it was great times with you
(violin solo)

An attendance list on the door
You rush and wish your friends have signed it for
you

And on those days you feel you can't take it more
Tell me about it over breakfast before we go

Piling up all the work, but perfectly organized
Just like lab report, for last minute
Get together and study for the exam
If academia doesn't work let's make an escape plan

I know it's only been two years of studying
Two years of party, growth, quarantine and virtual
space we shared
Maybe not much, maybe enough, to end the
beginning of a new life



Musical performance and Song Text by Lucia and Hanna (class 2019/2020).

Hanna DUBROVSKA and Lucía ROJAS MEZA joined the Neuroscience Program in 2019. While Hanna left the program with a Master's degree in 2021, Lucía is currently doing her PhD at the Neurophysiology group with Jeong Seop Rhee at the Max Planck Institute for Multidisciplinary Science (City Campus).
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Perianen RAMASAWMY a.k.a. Krishna is currently doing his doctoral thesis on combining mindfulness meditation and non-invasive brain stimulation in the treatment of chronic pain under the supervision of Prof. Andrea Antal at the University Medical Centre, Göttingen. He is one of the two PHD representatives 2021/2022.

Neuro PhD retreat: a global journey

by Perianen Ramasawmy

2021 would have been the year in which our sister programs, MolBio and Neuro, would have joined hands to give one of the best PhD retreats ever seen. With COVID-19 still alive and kicking, the joint retreat had to be cancelled and it was not possible to travel to another city for our annual multiday event combining scientific talks, posters, career talks and fun activities altogether. This year was different with a one-day retreat in Göttingen; nonetheless, we were all excited for this event bringing together all the PhD students of the IMPRS Neuro programme. After weeks of organisation by our dear program coordinator Sandra and PhD student representatives Delane and Krishna, the most awaited day had finally arrived.

Saturday 9th October, early morning. Instead of heading to the Göttingen Bahnhof, we made our way to our beloved classroom in the ENI. It was a nostalgic moment to find ourselves once again in the room where we spent most of our Master's years. Recollecting the great lectures we heard and the fun times we had with our

friends and colleagues in this classroom, we woke ourselves up with some hot coffee before the kick-start of the Neuro PhD retreat 2021. Our faculty members, Prof. Susann Boretius and Prof. Tobias Moser, joined us for the morning session.

The schedule for the retreat seemed to promise a boring day filled with back-to-back scientific talks by each student. 'Dear passengers please fasten your seat belts and get ready for take-off', announced the moderator and PhD representative Krishna. To our surprise, we were about to embark on THE trip of our lives, travelling across four continents and nine countries in one day. Our first stop was the country that is known for the Brain Prize, one of the most prestigious neuroscience prizes, and which is the birthplace of Lego and where, if you are not married by 25 years old, you get a special shower with cinnamon powder – Denmark. In Copenhagen, Tor gave us an insight into the development of *in vivo* X-nuclei MRI in psychiatric diseases. Our private Lufthansa airplane took us to our next destination: a country with the oldest winery on earth and

where chess is a compulsory subject in school – Armenia. Seated in the Tatev Monastery overlooking the scenic Vorotan River gorge, Nare enlightened us about the mechanisms of sound encoding in the cochlea. Crossing the crystal blue seas of the Indian Ocean, we landed on the yellow sandy beaches of Mauritius, land of the Dodo. Enjoying some traditional local snacks, we listened to Krishna's talk on combining mindfulness meditation and non-invasive brain stimulation for the treatment of fibromyalgia syndrome. Whenever one mentions art and brain, the first picture that comes to mind are the breath-taking drawings of Ramón y Cajal. The next stop was indeed Spain, where we learnt about the contribution of the activity-dependent presynaptic ultrastructure changes to short-term synaptic plasticity from Inés.

The travelling made us hungry and we were treated to a superb vegan buffet of Middle Eastern delicacies from Café Shirin, a local Persian restaurant in Göttingen. The menu included hummus, falafel, salads, breads and saffron flavoured rice, among others.



Teatime outside the ENI.



Scientific talks in the ENI.

After enjoying our lunch outside in the sun, we continued our trip. Our next destination was a mystical land, home to both the first vampire and great scientists including Nikola Tesla and Mihajlo Pupin, amongst others – Serbia. In Belgrade, Sonja gave us an insight into her PhD work about the kinetic analysis of the neuronal SNARE protein interactions. As our fun activity, we travelled to Colombia for the biggest fiesta of the year, the Carnival de Barranquilla. To keep our arteries pumping as we showed our dance moves, Alejandro expounded on how the oligodendrocytes communicate with the brain vasculature. Another long flight was planned as we travelled the Pacific Ocean to reach the land of spices, colours, the zero, Yoga and plastic surgery – India. To better understand how fruit flies are attracted to juicy Indian mangoes, Madhura talked about dynamic vision in the peripheral visual system of the *Drosophila*. We also learned about sensory predictions in the primate face-processing network from Tarana. It was then time for afternoon tea accompanied by vegan Apfelkuchen with Strudel. Since the organisers forgot about hot chocolate for the retreat attendees, we flew by KLM to the land of cocoa powder and gin – the Netherlands. Relaxing in the tulip fields, we listened attentively to Linda's talk on novel methods of studying the ionic mechanisms of neurotransmitter transporters. We culminated our global tour by taking our dear Deutsche Bahn back to the city we have been calling home for the last years – Göttingen. Surprisingly, the train was on time. As we sat in our ENI classroom, we enjoyed the last scientific talk of the retreat given by Elsa on



Hungry? Vegilicious Middle Eastern buffet was on the menu for lunch.



IMPRS Neuro PhD retreat team 2021.

the neural basis of acoustic communication in *Drosophila*. We bid farewell to our 2021 retreat with a group photo to immortalise this day.

Note from author:

What makes the IMPRS Neuro programme special is our diversity. Being

in such an international group makes us travel through each other's homelands while being in foreign land. Despite a retreat outside Göttingen not being possible for 2021, the organisers decided to make a virtual trip out of this day, visiting each home country of the presenters.

The first-ever Neuros Master's retreat

by Yuliya Badayeva

One night early in 2021, two great friends were catching up over dinner after Christmas holidays. Since November 2020, Covid-19 restrictions had become strict which meant no in-person lectures, tutorials, and social events like culture nights. For some time even, only several households could meet at a time. Unfortunately, these challenging circumstances meant that the newly enrolled IMPRS Neuro class could not spend time, learn, and connect with each other as a group. And on that night, the idea for a Neuros Master's retreat was born.

With unanimous support from the Neuroscience Office and Neuroscience Program Committee, an excellent student planning committee, and of course double vaccination as well as preventive Covid-19 tests, the idea was turned into reality. Fast forward 6

months of fruitful yet intensive studies and 19 successfully completed written and oral exams, we were off to the town of Uslar for the first ever Neuroscience Master's retreat!

Arriving at our destination in the Landhotel Am Rothenberg, we found ourselves surrounded by peaceful nature, the perfect place to wind down after our exams, share ideas, and look forward to our futures together. To start off the retreat, we were joined by two IMPRS Neuroscience program alumni, Dr. Oana Dormann and Dr. Nicolas Snaidero, who shared with us their experiences of life during and after graduate studies, including possible career routes within and outside of academia. With momentum already rolling, we continued with an open discussion on how we see our future as scientists and what we hope to contribute to our fields of

interest. To end off the first day, we played a student-led and organized game of trivia based on Göttingen, scientific topics, and fun facts about students in the batch. We were all very excited that our Neuroscience Program team were able to join us for this day, their support throughout the year has been invaluable for us – thank you Jonas, Sandra, Franziska!

Over the next day we continued our conversations, with workshops on different aspects of good scientific practice (animal handling, authorship, supervision, wasting of plastic/non-biodegradable materials, among others) and the future of science (open science, peer review, research industry, and the reproducibility crisis). Public speaking being an important part of science, we also organized an activity to train ourselves to think on the spot and build con-



confidence by practicing. Let's say this discussion may have led us closer to uncovering the intricacies of the 13th cranial nerve; we will keep everyone updated on the status of experimentally validating our hypotheses. Additionally, inspired by lectures and conversations throughout the year, our retreat also included a viewing of a recorded lecture by Dr. György Buzsáki on packaging and segmentation of neural information and by Dr. Andrew Huberman on the plasticity of the brain. To end off the retreat, we had two excellent student presentations that engaged us in physics that draws on everyday objects but expands to many other fields of application - yes, spaghetti can be broken into only two pieces!

All in all, there was no better way for us to end off the first year of our studies. Through the ups and downs of an especially challenging year, we were always there to support and uplift each other, and our connections and group community built stronger with the retreat. We are incredibly grateful to the Neuroscience Office and Neuroscience Program Committee for their help in making this happen. Onwards and upwards, together!



Yuliya BADAYEVA is a Master's student in the Neuroscience program (2020/2021 class). She worked on her Master's thesis in the lab of André Fischer.

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For details regarding the research of all faculty members, please see www.gpneuro.uni-goettingen.de/content/c_faculty.php

No faculty members have left or joined the program since spring 2021

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