Karlsruhe Institute of Technology

YIN Insight 2019/2020

The strong network of junior professors and junior research group leaders at KIT

Hot Topic
The 2nd KIT Further Development Act – what does it mean for junior professors

YIN Statistics 2019/2020
6.8 million of subsequent funding and
170 weekly teaching hours per semester

Scientific Highlights
14 ERC grantees among YIN members & alumni
Synergy Grant, US ECP, Sustainable Forests

Editorial

Dear reader,

The year 2020 has been challenging for essentially everybody, and for scientists on temporary contracts even more so. At universities, teaching and conferences have gone virtual, labs have been closed, access restricted, home office and on-line teamwork have become the new standard in many cases. However, life goes on and things of great importance for young research group leaders and junior professors have still happened.

One, as also highlighted by the kind greetings of our Vice President for Human Resources and Law, Christine von Vangerow, certainly is the 2nd KIT Further Development Act. It marks a big step forward towards the unification of the University Sector and the Large-Scale Research Sector at KIT and is also addressed by the Hot Topic of this year's YIN Insight. Its implementation will certainly take substantial efforts in the near future. At YIN, we will try to support this process as best we can, since it will likely have a significant impact on the tasks and duties of future junior professors and group leaders as well.

In the context of changing laws and the pandemic, we thought that it would also be insightful to provide a closer look at the "12-year-rule" for colleagues working on temporary contracts. The concept sounds quite simple on paper, but is not, when it comes to real life.

We also want to highlight some of the achievements of our members in the past year, including successful project proposals, research articles, awards, and promotions as summed up in the traditional "Facts & Figures" section. Despite the severe contact restrictions, YIN's advanced training program kept going and embraced new formats and possibilities.

Finally, we want to showcase the career paths of two YIN Alumni – Prof. Stefanie Speidel and Dr. Danilo Maddalo. Thus, we continue to share insights into potential career pathways for our current and future members, while highlighting that these can be quite diverse and exciting in many different ways.

We wish you an enjoyable read and, please, take care and look after yourself!

The PR Committee

Dr. Dominic Bresser Dr. Nadine Rühr Dr. Somidh Saha Dr. Thomas Sheppard Dr. Philip Willke

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Christine von Vangerow
Vice-President for Human Resources and Law at KIT

Dear Young Investigators,

The Young Investigators Network (YIN) connects our most excellent scientific leaders at the KIT. It serves junior research group leaders and junior professors as a unique platform to exchange ideas and experiences and to address important matters to the executive board or the service units at KIT. Moreover, YIN members can improve and develop their leadership and management skills and get support in their personal development.

Above all, however, YIN serves the purpose of honest networking. Not only scientific ideas can be shared but also experiences around the own career planning since YIN was developed as a key element for the promotion of young scientific leaders. Here, they can exchange ideas about possible next career steps, gather knowhow from others, take advantage of coaching or count on collegial advice.

I am well aware that scientific career paths are still diverse and unpredictable. Permanent positions below the professorial level are limited and tenure track positions granted only rarely. Funding for fixed-term external projects has increased, creating additional fixed-term positions in their wake.

Uncertain career prospects, temporary employment and the fact that it is difficult to plan a career path provide less than ideal conditions for starting a family. I know, in the rush-hour of life, scientific leaders often have to balance the responsibility for their own research-group with the responsibility for a family.

All this in mind, I am grateful to have a strong Young Investigators Network at KIT for two reasons. First of all, here, coaching processes and mentoring procedures can be offered to every scientific leader to systematically support their individual career development. And secondly, to have a sounding board over which our young scientific leaders can address their issues directly, so we can work from our end towards more certain career prospects for them.

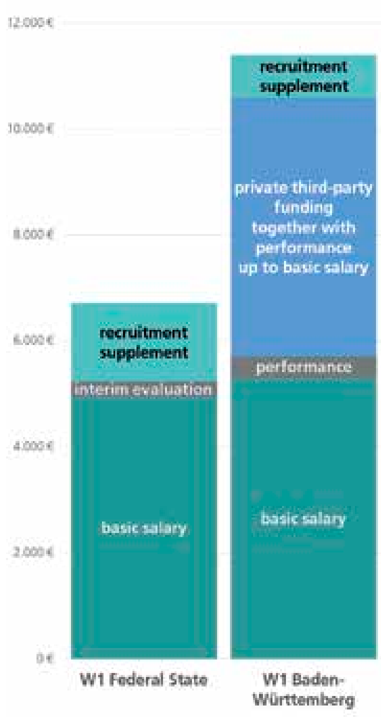
And finally, I would not like to leave the 2nd KIT Further Development Act unmentioned. With it, a milestone has been reached that will positively influence the scientific development of KIT. With new status positions, also for junior professors, and the possibility for all scientists to be active in both tasks of KIT, the large-scale research task and the university task, synergies are generated and the merger is further promoted. Thus, unique conditions have been created in the German science system to enable each individual to better exploit his or her potential and career opportunities.

Christine von Vangerow
Vice-President for Human Resources and Law
at the Karlsruhe Institute of Technology

The 2nd KIT Further Development Act

The effects of unified personnel and budget on young investigators

The State government of Baden-Württemberg adopted the 2nd KIT Further Development Act in February 2021. Thus, the legal course is set for KIT to strengthen the inner unity of KIT as one institution. Founded in 2009 as a merger of the University of Karlsruhe and the Research Center Karlsruhe, KIT has kept a dual character especially due to its two separate funding lines: While the university sector is funded entirely by the State, the large-scale research sector is financed by the federal government. This difference was reflected by the contracts of staff and their respective tasks. The renewed agreement between Federation and State promises to reduce administrative obstacles and enhances flexibility in the use of budget and the tasks of the staff at KIT. For young investigators – especially, for junior and tenure track professors – the new act will bring new chances, but also a lot of as yet unanswered questions.



Data compiled from the State Pay Law and the Federal Pay Law („Landes- bzw. Bundesbesoldungsgesetz").

New status "Junior Professorship at KIT"

Most welcome is the introduction of the new status of "junior professor at KIT". It will hopefully supersede and unite the two classes of junior professors that exist at KIT right now: those in state service and those in federal service. Accordingly, the notes of the 2nd KIT Further Development Act (2. KIT-WG) state: *Thus, all junior professors at KIT will be treated equally and the possible conditions of the previous junior professors in the large-scale research sector will improve considerably because the previous state regulations will apply uniformly.*[1]

Until now, regular junior professorships at the university sector become state officials ("Landesbeamte") and are paid according to the State Pay Law. Junior professors mostly financed by federal means, however, are employed by the university sector and suspended from this position to work at the large-scale research sector at KIT ("Jülicher model").

A new status to unite the two classes of junior professors at KIT

As a result, the junior professors working at the large-scale research sector of KIT are payed as federal officials ("Bundesbeamte"). For them, the basic wages are lower and they have very limited possibilities to negotiate allowances: The State Baden-Württemberg[2], in contrast, provides up to 400 € extra on a monthly basis in case of high recruitment interest or for excellent performance. Together with a bonus for research and teaching from private third party funding, this non-pensionable allowance may reach up to 100% of the basic salary. The federation only provides a bonus of 273 € after a positive interim evaluation.[3] A recruitment supplement can in both cases only be granted if there is a real possibility that the position might not be filled adequately otherwise.[4]

The modalities of implementation

While the 2. KIT-WG has been published, prospective junior professors at KIT are as yet uncertain when they might negotiate under the new conditions. First of all, the federal funds for large-scale research need to be made available to KIT via the State. Only in a second step, the status of *junior professorship at KIT* can be defined and implemented. These interrelated processes have just started and might take a while to unravel. Hence, appointments analogous to the Jülicher model will still be pursued in the near future. Nevertheless, all junior professors are meant to be transitioned to the new status, once it is put in place.[5] This gives rise to the question whether junior professors appointed analogously to the Jülicher model who have negotiated on the premises of federal law, get a new opportunity to negotiate under state law? The 2. KIT-WG just addresses the issue that the transition should not come with disadvantages.[5]

We as YIN hope that, with their transition to the new status, all junior professors appointed analogously to the Jülicher model will be offered the opportunity to re-negotiate under state law.

Teaching obligations

Though, the new status of junior professorship at KIT aims to unite, it does not extinguish the basic difference in funding sources: While university activities are funded entirely by the State, the large-scale research tasks are financed by the Federation and the State at a ratio of 90:10, which is the typical funding key for Helmholtz centers. Thus, the staff financed from federal funds needs to focus on performing large-scale research.[6] The explanatory statement of the 2. KIT-WG announces in this regard: *Consequently, the personnel financed in this way are not subject to any teaching obligations, but nevertheless perform additional teaching of two semester hours per week that is customary in non-university research contexts (additional teaching)*.[7]

Negotiable teaching obligations for junior professors?

Junior professors seem not to be excluded from this regulation. Hence, if financed from large-scale research funds, they might also be initially free from teaching obligations. Does this leave room to negotiate teaching duties, e.g. only 2 weekly teaching hours per semester (SWS), instead of 4 SWS before and 6 SWS after a successful interim evaluation like the State Regulation of Teaching Duties demands? And would this also be possible for junior professors at KIT funded by university budget if they take on extra large-scale research responsibilities in exchange?

We as YIN hope that all junior professors at KIT will get equal chances to negotiate teaching obligations.

Missing link to future changes of the LHG

Laws structure the life of society and may adapt to political and societal challenges. The most recent example is the corona pandemic and, in response, the new possibility to extend temporary contracts. Under the previous KIT Act §20, there was a dynamic link to the most recent version of the State Higher Education Act (LHG) for junior professors. Thus, they could immediately benefit from the extension option according to LHG §45 (6) ("two years per child") introduced in 2018. *Akademische Räte*, on the other hand, could not, because for them, a dynamic link was missing. They got the option just now, when the 2. KIT-WG was passed with the current version of the LHG as its point of reference.[8] While this is good news so far, the reference to the this version of the LHG is now frozen – even for junior professors. Thus, the regulations for KIT will not automatically adapt to future changes of the LHG.

We as YIN hope that public officials on temporary contracts at KIT will not be forgotten when future amendments of the LHG occur.

Conclusion

Overall, the 2nd Further Development Act opens up great opportunities for young investigators at KIT. It will be exciting to see them translated into practice.

[1] Cf. www.landtag-bw.de/files/live/sites/LTBW/files/dokumente/WP16/Drucksachen/9000/16_9420_D.pdf (p. 98)
[2] Cf. Landesbesoldungsgesetz BW §59f
[3] Cf. Bundesbesoldungsgesetz - Anlage II (1)
[4] Cf. Landesbesoldungsgesetz BW §75 (2) and Bundesbesoldungsgesetz §43
[5] Cf. www.landtag-bw.de/files/live/sites/LTBW/files/dokumente/WP16/Drucksachen/9000/16_9714_D.pdf (article 4)
[6] Cf. www.kit.edu/kit/english/pi_2021_009_federation-and-state-agree-on-further-steps-to-complete-the-merger-of-kit.php
[7] Cf. www.landtag-bw.de/files/live/sites/LTBW/files/dokumente/WP16/Drucksachen/9000/16_9420_D.pdf (p.57)
[8] Cf. www.landtag-bw.de/files/live/sites/LTBW/files/dokumente/WP16/Drucksachen/9000/16_9714_D.pdf (§20)

ERC GRANTS

ERC SYNERGY GRANT

groups of 2 to 4 researchers and their teams
funding up to 10 million euro

2020: Benno Meier
(KIT together with ENS and Radboud University)
Highly Informative Drug Screening by Overcoming NMR Restrictions

ERC STARTING GRANT

researchers 2 to 7 years after PhD
funding up to 2 million euro

2019: Katharina Schratz
(Heriot-Watt University, UK, since 2019)
Low-regularity and high oscillations: numerical analysis and computation of dispersive evolution equations

2018: Frank Schröder
(University Delaware, USA, since 2018)
Digital Radio Detectors for Galactic PeV Particles

2017: Cornelia Lee-Thedieck
(University of Hannover since 2018)
BloodANDbone – conjoined twins in health and disease: bone marrow analogs for hematological and musculoskeletal diseases

2017: Lars Pastewka
(University of Freiburg since 2017)
Emergence of Surface Roughness in Shaping, Finishing and Wear Processes

2016: Corinna Hoose
Closure of the Cloud Phase

2013: Erin Koos
(University of Leuven since 2016)
Capillary Suspensions: A Novel Route for Versatile, Cost Efficient and Environmentally Friendly Material Design

2013: Pavel Levkin
DropletMicroarrays: Ultra High-Throughput Screening of Cells in 3D Microenvironments
2015 & 2017 Proof of Concept Grant each 150K€

2011: Alexander Nesterov-Müller
Combinatorial Patterning of Particles for High Density Peptide Arrays
2015 & 2017 Proof of Concept Grant each 150K€

2009: Regina Hoffmann-Vogel (University of Konstanz since 2018)
Structural and Electronic Properties of Nanoscale Metallic Contacts Fabricated by Thermally Assisted electromigration

ERC CONSOLIDATOR GRANT

researchers 7 to 12 years after PhD
funding up to 2.75 million euro

2020: Tonya Vitova
THE ACTINIDE BOND properties in gas, liquid and solid state

2018: Bastian Rapp
(University of Freiburg since 2018)
The Capillary Lock Actuator: A novel bistable microfluidic actuator for cost-effective high-density actuator arrays suitable for large-scale graphical tactile displays

2017: Christian Greiner
Deformation Mechanisms are the Key to Understanding and Tayloring Tribological Behaviour

2016: Martin Weides
(University of Glasgow since 2018)
Interfacing spin waves with superconducting quantum circuits for single magnon creation and detection

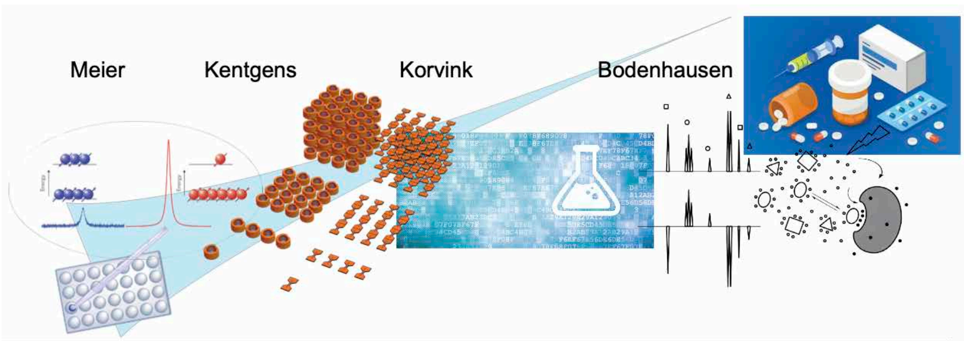
Synergy – 4 great minds from Europe

14 million euro for Highly Informative Drug Screening by Overcoming NMR Restrictions (HiSCORE)

The HiSCORE project promises to develop nuclear magnetic resonance (NMR) methodology enabling information-rich, high-throughput drug screening. To scan large libraries of drug candidates against a given target, a boost in signal strength would enable a significant reduction in sample size, thus, paving the way towards parallelization. This is where Benno Meier will bring in his expertise on hyper-polarized NMR. Together, the HiSCORE team will develop and test a number of technologies at the three sites Karlsruhe, Paris, and Nijmegen. As one of the principal investigators, Benno Meier is the first YIN member to claim an ERC Synergy Grant and the 14th ERC grantee within the network. The success rate is around 7.7% and money-wise it is basically the equivalent of four ERC Advanced Grants.

Conventional High-Throughput-Screening (HTS) methods are easily able to test one million substance candidates, but provide information of low dimensionality and poor quality. NMR is already a very important tool for drug discovery, since it can observe the binding of drugs to specific disease-related targets on molecular level with very high accuracy. However, so far, it is slow, low in throughput, and high in costs. To tackle these pharmacological challenges, HiSCORE merges the most innovative branches in the field of NMR – including hyper-polarization, microcoils, microfluidics, parallel acquisition, and machine learning. This way, processes will be accelerated by a factor of 10,000: enabling full characterization of up to 100,000 compounds within weeks.

Benno Meier and his group, together with Arno Kentgens' team from Radboud University in Nijmegen, will develop methods for parallel orientation or polarization of nuclear spins in liquid samples. These spins, like tiny magnets, precess about an applied magnetic field and, thus, allow to obtain information about the atoms and their chemical environment. Normally, only 1 in 10,000 spins is aligned with respect to the applied field. Hence, the signal is very tiny. With hyperpolarization, nearly all spins are aligned. This promises an increase in signal intensity by up to four orders of magnitude compared to standard NMR experiments. Part of the research is also to provide hyper-polarized samples at a much higher throughput. While now, they can be provided about one every hour, the goal is to provide up to four samples per minute. The highest polarization levels can be achieved at temperatures as low as 1 Kelvin, but the transfer of electron polarization to the nuclei at these temperatures is slow, and requires 30 to 120 minutes. "In order to provide hyperpolarized substrates at a much faster rate, we will explore several new strategies for a faster transfer. Crucially, we will also polarize many samples in parallel", says Benno Meier.



In HiSCORE, compound libraries of drug candidates are hyperpolarized (Meier) and detected using microfluidic detectors (Kentgens) in parallel architectures (Korvink). Magnetic resonance techniques for improved contrast (Bodenhausen) enable a rapid characterisation of drug candidates. (Graphic: HiSCORE)

Jan Korvink's Team at KIT will use microstructure technology, computer chip design, and embedded systems to conduct a large number of measurements in parallel, and will tackle machine learning challenges. In Nijmegen, the team of Arno Kentgens will develop para-hydrogen and rapid-melt DNP hyperpolarization strategies, and optimize handling for small samples. In Paris, the team of Professor Geoffrey Bodenhausen will improve methods to quantitatively evaluate interactions between biomolecules and drug molecules.

Interview with ERC Synergy Grantee

YIN member Benno Meier shares his experience

Dr. Benno Meier
HYIG at KIT

Why apply for this specific format?
From the outset, it was clear that we should work together. Our goal is to combine hyper-polarization, miniaturization, and drug screening. So, we really co-developed this grant together between the 4 principal investigators (PIs) and we also had help by two experts in drug screening. They were not PIs, but their contributions were also very significant.

Have you applied for an ERC grant before?
It was the first application for a synergy grant for all of us, but not the first with the ERC. Three of us had mixed success with the ERC in the past. Personally, I had failed with an ERC starting grant application in 2018, but it was a very educational experience. As a team it worked much better.

What is different from other ERC formats?
For the synergy grant, the idea is that you come up with a team to tackle a somewhat larger challenge that no one could meet on their own. This really has to show. I don't think you could do it in a way that one would write the grant application and assemble a team afterwards. It needs to be a team effort from the outset. If you are successful, the partners will also get about equal shares.

How much work is the grant application?
I would say it is overall similar to a starting or a consolidator grant. The format of the documents you need to develop is exactly the same. But now of course you have to put extra work into the coordination with the whole team. But I really enjoyed that process. If you work with others, you can play with ideas and see them develop. Overall, I believe the project is well designed with quite ambitious objectives.

What about a future societal impact?
To me, the question of applicability of fundamental research seems very important, because it guides our activities. For the ERC panel, I think you need to have an idea of an application that is appropriate to the state of your technology. If it is basic research, it helps of course when there is an important application in sight. In our case this is drug screening.

How did you find and choose your partners?
You have to have a degree of interdisciplinarity. But you should also not be too far apart, because you need to work together in a very tight way. It would not work if one partner develops something to a certain state and then just hands it over. That would not be called synergy. In our case, we have different backgrounds, from physics, engineering, and chemistry. We were a bit unsure whether we were interdisciplinary enough, because we are all active in magnetic resonance. Though, in the end it worked out well.

In addition, you can always look up former awardees. That tells you something about the makeup of these grants. On that basis, I would say that to have a European balance is important.

Tailored interview preparation
via the YIN Advanced Training Program

We did the coaching sessions exactly like we did the ERC interview: over zoom with all four of us at different locations. Since we were not allowed to use slides, the focus was on body language, voice, background setting, camera contact, and how to present as a team. The trainer who is also an opera director from theatre gave us expert feedback and advice on this. One thing that I would not have learned if it wasn't for constant reminders was that camera contact is essential. What works best for me is to look straight into the camera lense, to really focus on it. The impression is just a different one! Another was body language and gestures. They make presenting and visualizing research more lively compared to just standing there. You also have to find a balance, so that each PI spends the same amount of time talking without it appearing artificial. We were playing with ideas how to take turns, but in the end it worked out quite naturally during the interview. However, we had to practice and internalize the right mindset so that everyone showed enough restrain but also were proactive enough. We really enjoyed these coaching sessions. I fully recommend it – especially if you have a live presentation. And you also learn something about yourself.

Though, one non-European PI can also be part of a synergy grant. You probably also want to have diversity between younger and also more experienced PIs. Moreover, I think this also has an appeal for the proposal as a whole because people can now join this project as a postdoc or a PhD and they immediately have a European perspective and will be able to see other labs. A certain degree of mobility and plans to move researchers between labs is basically built into the grant. In my view this is very tempting.

Does the ERC ask for a new cooperation?
Not strictly. I think prior to the grant we had perhaps 1-2 shared publications. Of course, we knew what the others were doing. But we do not have a long history of working together.

What was the best advice you got?
When you write the proposal, you have to put great effort into making it simple and comprehensible. You have to consider that the first part will be refereed by people that are not experts in your field. It is really important to be aware of that. Same as in any ERC application.

Put great effort into making it simple and comprehensible

What further advice would you give?
When you apply for such a funding, you will need help. Together with the Research Office at KIT, we organized 2-3 proper mock interviews which were extremely helpful. We also hired a consultant to support us during the developmental phase of the proposal. In the end, this carried through to the interview stage. He stressed that we should see the interview as an opportunity to present the positive aspects of our proposal. We should not become defensive at all as there are always risks with any project. It is important to have people remind you of these things. Of course, the good thing about a synergy grant proposal is that we all have different strengths and we could combine them. We wrote a substantial part of it together during online meetings where we worked directly on a shared document.

How was the Interview?
For the first time in ERC Synergy grant history, we were not allowed to show any slides and it was via zoom. So, we had to use words and body language only. It was 8 minutes to present the project and then maybe about 25 minutes of Q&A. We practiced that hard. If you are at that stage, the chances are 50/50. So every second counts. We developed a text that we wanted to present but then it is of course impossible to read out a text. You can memorize it, but you also have to reinvent it as you present it.


This probe for Dynamic Nuclear Polarization (DNP) is used to polarize a single sample or bullet at a temperature of 1 Kelvin. (Photo: Karel Kouril, KIT)

How were the questions?
We felt quite ok with those. There were tougher questions at the mock interviews, but in general we had a good overlap between mock and real interview questions. We also had continued to collect questions, thought about the answers, and had actually written them down. In the interview, of course, we did not read out answers, but the panel wants to see that you have thought about all the different aspects. And to be convincing, you must have thought about them.

Anything else, you would like to share?
I can share a fun fact. We prepared meticulously. But actually on the day of the interview, Jan Korvink had problems to connect to the internet from his holiday home in France. So, he and his wife took the car, went to a mobile network antenna nearby, and parked the car directly underneath. Then, he did the interview from within the car and with a green screen no one noticed. So, if you are sufficiently prepared and flexible, you can handle it!

Regenerating fire-damaged forests

YIN members investigate how to build up rejuvenated and more fire-resilient forests

Dr. Somidh Saha
KIT Junior Research Group

Long-lasting droughts increase the risk of forest fires. In 2019 and 2018 alone, fires destroyed over 50 square kilometers of forest in Germany.[1] However, the forestry sector and fire departments are still lacking knowledge on how to successfully cope with forest fires. In the ErWiN project, scientists now study how threatened areas can be detected, the fire risk reduced, and burnt forests sustainably regnerated. The project is funded with about 1.5 million euro by the Fachagentur Nachwachsende Rohstoffe (central project-coordinating agency in the area of renewable resources). Within this framework, the YIN members Somidh Saha and Nadine Rühr lead the subproject *Development of silvicultural strategies for the regeneration of fire-damaged forest stands*.

Planting of multiple tree species after the forest fire at the study site Treuenbrietzen, Brandenburg (Photo: Uwe Honke)

An important goal of the ErWiN project is to quantify the regeneration of forests after a fire. Somidh Saha and Nadine Rühr will analyze the post-fire recovery and physiological performance of seedlings and saplings of different tree species at the field study sites in Treuenbrietzen and Beelitz in Brandenburg. These sites were exposed to severe fires in 2018. The study includes (1) comparing the sprouting ability of tree stems, growth, and ecophysiological performance of several tree species after a forest fire. The researchers will (2) examine the growth and vigor of seedlings and saplings grown by natural regeneration from seed and by artificial regeneration through planting; (3) assess the impact of forest composition, structure, and other variables on post-fire regeneration; (4) compare different types of artificial reforestation, e.g. group versus row planting; and, finally, (5) quantify the germination and post-germination growth of the ten most common tree species to fire-induced heating. The results of this subproject will help foresters develop plans to restore fire-damaged sites.

Dr. Nadine Rühr
Emmy Noether Group

Besides, field data collection and planting trials at burned forest sites, Somidh Saha and Nadine Rühr will also conduct controlled experiments with seeds collected from the burnt areas. They will carry out germination tests in a high-tech greenhouse at KIT-Campus Alpin in Garmisch-Partenkirchen. In a second experiment, undamaged seeds of the ten most abundant tree species in Germany will be buried in the ground and then exposed to various temperature levels corresponding to those of small or medium fires. "We want to find out which seeds are still able to germinate after the heat treatment," explains Somidh Saha. As fallow lands after a forest fire are exposed to higher solar irradiation due to a lack of shading, the dark burnt ground will heat up more strongly. "Hence, post-fire regeneration success will depend on how well freshly germinated seedlings cope with these extreme conditions" says Nadine Rühr.

All findings will enable the team to determine how the different tree species recover after a fire. This fundamental knowledge may then be used by the forestry sector for future forest management to increase forest resilience. "It is generally known that mixed forests survive a fire much better than mono-cultures," says Somidh Saha. Therefore, it will be very important to find out which combination of tree species is most suited for reducing the risk of large forest fires. In almost 70 years, the drougth stress on German forests has never been as severe[2] as it is today (cf. Fig. 1) and millions of trees already have died because of it.

Somidh Saha and Nadine Rühr have exchanged research ideas during a meeting at the KIT-Campus Alpin. Trees and forests are their mutual research foci. Somidh Saha has studied forestry and was trained as a silviculturist. His research focuses on the management and restoration of forests to climate change impacts. Nadine Rühr studies the physiological responses of trees to extreme climate events, which she scales from the individual to the forests using process-based models. Understanding the ecological and physiological processes involved in tree and forest responses to drought and fire is essential for sustainable, silvicultural planning of forest restoration. This interdisciplinary linkage motivated both to cooperate and apply for funding.

A naturally regenerated seedling of aspen growing on burned stumps of Scots pine (Photo: Jeannette Hagen)

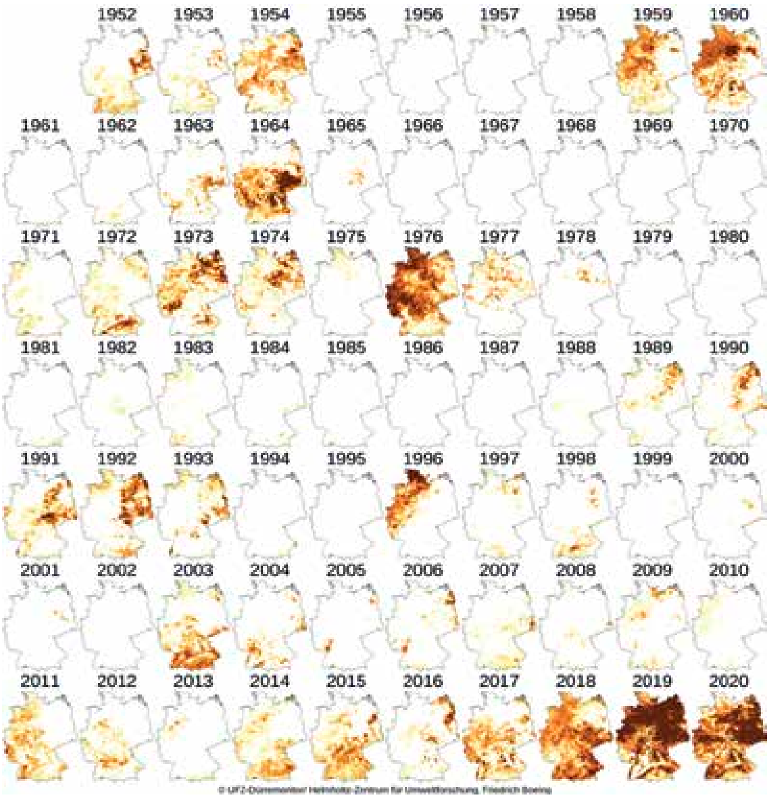


Fig. 1: Drought magnitudes in the total soil during the vegetation period from April to October. (UFZ-Dürremonitor/ Helmholtz-Zentrum für Umweltforschung, Friedrich Boeing)

For the ErWiN project, Somidh Saha and Nadine Rühr are jointly supervising doctoral researcher Katrin Fröhlich who is working at the Institute for Technology Assessment and Systems Analysis in Karlsruhe. In 2021, she and Somidh Saha collect field data on post-fire forest regeneration, tree health, micro-habitat, and soil seed storage from the sites in Brandenburg. Next year, controlled studies on germination and seedling physiology will be conducted at the KIT-Campus Alpin.

The ErWiN consortium was formed at KIT around Dr. Fabian Fassnacht who aims to improve the understanding of forest fire dynamics using deep learning and fire spread simulations. Scientists from the Thünen Institute in Brandenburg and the Institute of the Fire Service North Rhine-Westphalia are also involved in the ErWiN project. First preliminary results are expected in early 2022.

[1] Cf. ble.de/DE/BZL/Daten-Berichte/Wald/wald_node.html
[2] Cf. Schuldt et al. (2020): A first assessment of the impact of the extreme 2018 summer drought on Central European forests (https://doi.org/10.1016/j.baae.2020.04.003)

HYIG is part of US Exascale Computing Project

Hartwig Anzt talks about how he came to lead an effort in a US National Strategic Initiative

Dr. Hartwig Anzt
HYIG at KIT

Having become part of the Exascale Computing Project (ECP), the Helmholtz Young Investigator Group "Fixed-Point Methods for Numerics at Exascale" headed by Hartwig Anzt receives funding of more than a million euro until 2022. The ECP aims at providing powerful exascale supercomputers and develop a sustainable software ecosystem for scientific simulations. It is part of the US National Strategic Computing Initiative launched by the federal government of the United States of America (US). The goal is to enable the software capabilities for running simulations at exascale performance.

What is exascale computing in a nutshell?
The performance of supercomputers is quantified by how many floating point operations (that is additions, multiplications, etc.) a computer can perform within a single second. The prefix exa stands for a number with 18 zeros. Computing at exascale means to perform one billion times billion calculations in a second! The plan is that this year already, we will see a first supercomputer that can achieve this performance.

What does your group focus on?
It is great to have computers that have so much compute power. But doing billion billions of additions is not very useful: Instead, we want to have weather forecasts, climate models, or molecular simulations. So, there is a big gap between the computers being able to do a lot of calculations and actually having useful simulations. That is where we come in: We develop software that is able to use the compute power of supercomputers and translate it into useful simulations. The software has to address two challenges: 1) design algorithms that provide enough parallel work such that thousands to millions of processors can contribute to one complex application; and 2) address the increasing gap between computational power on the one hand and data transfer rate on the other hand by trading communication against additional computations – e.g. by compressing data before communicating and using different precision formats in distinct parts of an application.

We develop software that translates compute power of supercomputers into useful simulations

ECP was launched in 2015, but your group only joined in December 2019 – is this usual?
It sure is an exception. We are the first group outside the US to receive money from this project. Prior to starting my group here, I worked for four years at the University of Tennessee. The ECP consortium knew me and my software from back then. After I came to Karlsruhe to start my group in 2017, the ECP had strong interest to bring me and my expertise back to the US. In 2019, they offered me to lead an effort within the ECP that would come with some funding for my research here in Germany. However, reviewing all legal aspects was a lengthy process, and it took until the last quarter of 2020 to receive the first money.

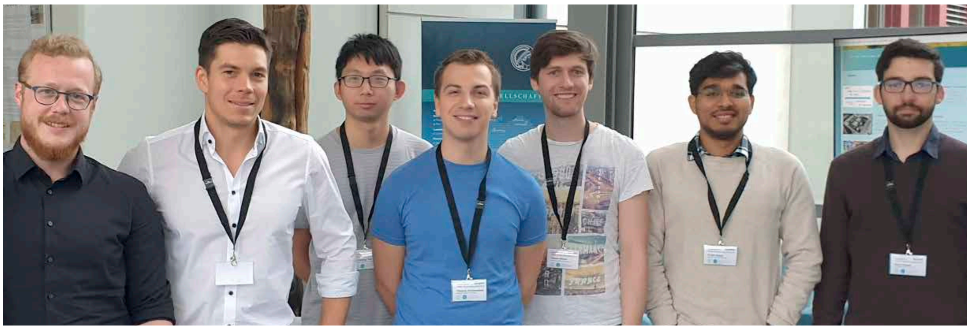
So, there was no call to apply to?
Not really. I basically wrote a page or two to outline how I plan the research, that's about it. But of course, I did not get the funding for the two pages, the decision was based on all the work I did in the last 7 years of my research.

You receive a large amount of funding from the US government – what about the rights?
All research we do is open science in the sense that all research results are published in scientific papers, all software we develop is released as open software. Thus, it is a win-win situation for us and the ECP.

All research we do is open source.

Besides funding, are there more benefits to being part of the ECP?
It gives us a lot visibility and access to the fastest supercomputers in the world. We are also part of a network of scientists that are all interested in producing excellent science, without having to compete for resources. In that sense, the culture

of support and collaboration inside ECP is an environment that I think we should adapt as a role model. It is much more fun and, thus, more productive to work in such an environment versus the competition-focused environment we often experi-ence.



The Helmholtz Young Investigator Group FiNE led by Hartwig Anzt, second from the left. (Photo: Yu-Hsiang Mike Tsai, KIT)

What about reports, evaluations, required traveling, or nightly conference calls?
Sure, we have to write reports and have to pass "red-team reviews". But you have that for any project. And the reporting effort really is reasonable. Also, ECP has set up a comprehensive support infrastructure that you can leverage to succeed in your reviews. They give advice on designing your presentation slides, let you know on which topics to focus and for what questions to prepare, etc.. Traveling? Yes, in general... but with Covid... I am actually looking forward to have in-person meetings. And nightly conference calls? Yes, unfortunately. But my personal deadline is midnight, and everybody accepts that, and they plan accordingly.

More productive within a culture of support and collaboration

What would you advise others who'd like to become part of a scientific US initiative?
Don't focus on h-index, title, or paper count. These are not the metrics they are interested in. They are interested in getting research done. It is your open source research work and your reliability that makes you attractive for large projects. And, if you have shown to produce good work, they may call you up.

Did your connection with the ECP in any way boost KIT in becoming part of National Supercomputing Alliance?
Well, let's say, us being part of the US Exascale Project sure did not hurt the application to become a national High Performance Computing (HPC) center. The admission of KIT to the National Supercomputing Alliance implies secure funding for the Karlsruhe Supercomputer (HoreKa) becoming operational in summer 2021.

What is your role for KIT as a national center of High Performance Computing?
Together with partners from Erlangen, I will design a teaching module on numerical methods for high performance computing. And my group will contribute with their expertise in math libraries, graphic processing unit (GPU) computing, and sustainable software engineering. In that context, our experience from developing the cross-platform sparse linear algebra library Ginkgo for GPU architectures will also come in handy.

An endorsement for Scientific Open Source Software

One core aspect of the US Exascale computing project is that politics is acknowledging the importance of scientific open source software, and half of the budget is spent on building a sustainable software ecosystem for high performance computing. In Germany, getting funding for sustainable software development is still hard, and software is far being accepted as an infrastructure like a laboratory or a supercomputer. To improve the situation, we recently published an article on how to create "An environment for sustainable research software in Germany and beyond: current state, open challenges, and call for action".

Facts and figures from 2019/20

The data was compiled from the YIN survey 2020 (27 participants) and the YIN database

YIN members

The number of YIN members is rising once again. This is mainly due to the newly installed tenure track professorships at KIT. Having reached 52 by the end of 2020, the number of members is close to the level seen shortly after the first Excellence Initiative (cf. Fig. 1). The decline following 2014 corresponded to the conclusion of KIT-internal groups funded by the first Excellence Initiative. The last one ran out in 2017. Compared to 2019, the share of women in YIN has slightly dropped from 30% to 27% in 2020. Nonetheless, KIT has achieved its goal to appoint 40% women among the junior professors.

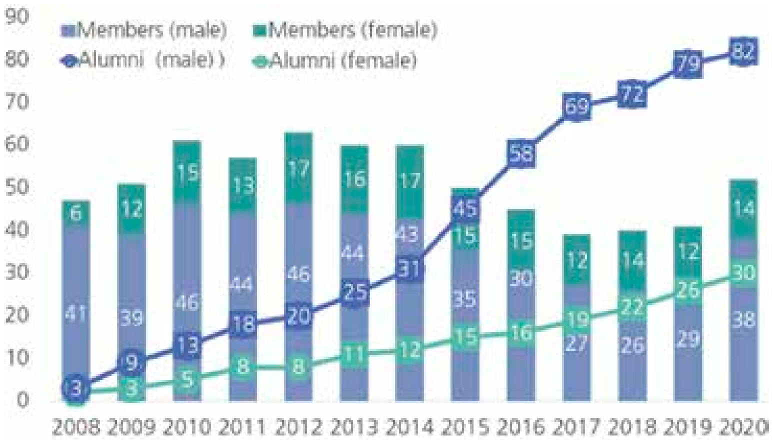


Fig. 1: Number of YIN members and alumni from the foundation until the end of 2020 (YIN database, Dec. 2020)

YIN is an international network. 24% of our members have an international background, including members from Europe, America and Australia. This is a rise of 6% compared to the previous year. Directly before taking up their current positions, 46% of all YIN members have been abroad (Europe, North- and South America, Asia and Australia), 25% came from other German universities, and 29% from KIT. (Fig. 2).

YIN members lead scientifically and financially independent junior research groups at KIT that consists of at least one scientific staff member with at least a Master's degree. This position or the group leader's must have been acquired externally or internally in a competitive process (e.g. DFG own position or appointment procedure).

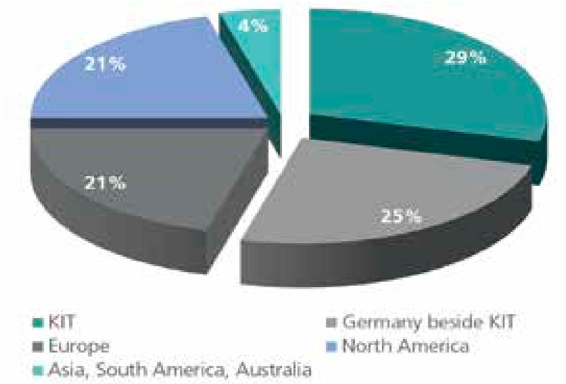


Fig. 2: Positions held by YIN members before starting their research group at KIT. (Data from survey 2020)

The average age of YIN members at the start of their junior research group is 33.4, with the youngest being 29 years old and the oldest 38. As the term of these groups is typically between four and six years, the average age of the current YIN members is 37, ranging from 31 to 42. Thus, it is not surprising that starting a family and and striking a balance between work and family are important topics. More than half of the YIN members have at least one child and take an average of 6.5 months parental leave.

YIN alumni

After concluding their junior research groups or junior professorships or leaving KIT, many former YIN members choose to become alumni. Their number is constantly growing and has reached 112 by the end of 2020. Last year six (former) YIN members have obtained a professorship, thus, raising the appointment ratio to 53% – counting 42 university professors, 6 professors at universities of applied sciences, 7 associate, 3 assistant, and 3 extraordinary professors.

Areas of research

YIN members cover four areas of research. In 2020, the majority of YIN members work in the field of natural sciences (47%), followed by engineering and material sciences (22%), economics and humanities (18%), and computer science and mathematics (14%) (see Fig. 3). Compared to the year before, the number of groups in the natural sciences, in economics, and in the

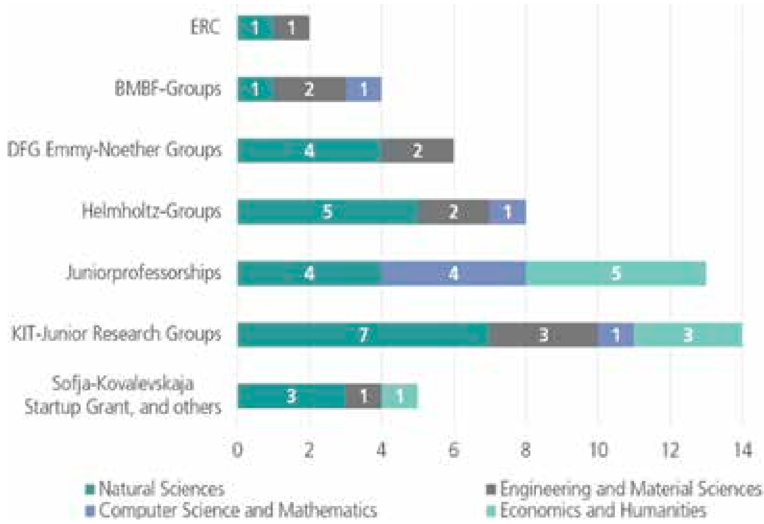


Fig. 3: Distribution of YIN research groups according to the funding program and areas of research (YIN database Oct 2020).

humanities has increased, whereas the number of groups in material sciences and computer science has decreased.

Types of research groups in YIN

YIN unites a variety of group types and funding sources. In October 2020, YIN counted 15 *KIT junior research groups*. In addition, there were 7 YIN members leading *Helmholtz Young Investigator Groups* that are partially funded from the Helmholtz Initiating and Networking Fund and partly by KIT and their hosting Institutes.

There are also many YIN groups that are funded entirely from external sources such as the Federal Ministry of Education and Research (BMBF) (4) and the German Research Foundation (DFG) via its Emmy Noether Program (6). Finally, there are 13 junior professors who are members of YIN. Other YIN groups are funded by the State of Baden-Württemberg (Margarete von Wrangell Program), by the Humboldt Foundation (Sophia-Kovalevskaja Grant) and by the EU (Marie Curie Grant). An overview, together with the area of expertise, is shown in Fig. 3.

Initial funding

Our survey shows that YIN research groups contribute a total of roughly 28 million euro, distributed over 3 to 6 years, towards research at KIT by their initial funding. This results in a contribution of about 6.3 million euro per year. The funding volume of the various groups varies between 170,000 and 2 million euro. Roughly 8 million come from KIT, whereas the remaining 20 million euro are externally funded.

Subsequent funding

In addition to the initial funding of their groups, YIN members acquire substantial subsequent funding. On average, each member raises roughly 250,000 euro extra a year. In 2019, subsequent funding amounted to 6.8 million euro in total. The majority, 79% of these grants, is provided by external funding agencies. 18% are contributed by KIT and 3% by industrial partners.

KIT-Associate Fellow

The KIT Associate Fellow temporarily grants restricted teaching and examination rights. Thus, junior group leaders acquiring the status, may gain experience in independent teaching, supervision, and examination procedures. At some KIT departments, Associate Fellows can be first reviewers for their doctoral researchers.

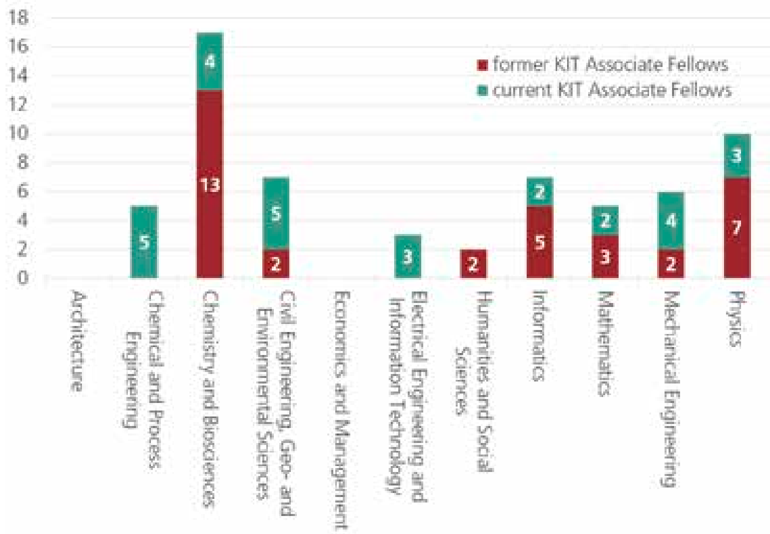


Fig. 4: Number of Associate Fellows at the KIT Departments in October 2020 (Data from YIN survey among the KIT Departments).

At others, they may only serve as an additional third reviewer. Despite these differences, the KIT Associate Fellow is a valuable instrument to recognize the structural and scientific independence of junior group leaders. By 2020, only two KIT departments have not yet appointed any Associate Fellows (Fig. 4).

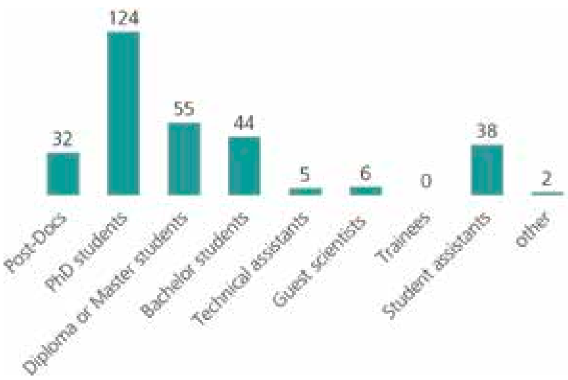


Fig. 5: Number of people working in YIN research groups.

Staff

The YIN research group leaders supervise a large number of employees, namely a total of 306 people. The average size of a junior research group represented in YIN is 11 members. The YIN research group leaders employ 32 postdoctoral researchers, 124 doctoral candidates, 55 Master students, 44 Bachelor students and 38 student assistants. The groups further employ 5 technicians and 6 guest scientists, as shown in Fig. 5.

Among the doctoral and postdoctoral researchers within the YIN research groups, 55% originate from Germany. Hence, the groups are very international. Among the doctoral students and postdocs working in the groups, 17% come from Europe, 17% from Asia, 1% from North and Central America, 3% from Africa, 6% from South America, and 1% from Australia/ Oceania.

Teaching and thesis supervision

Although the majority of YIN members have no teaching obligation, for most of them teaching forms a substantial part of their activities. About 89% of all YIN members contribute actively towards teaching at KIT. The following numbers

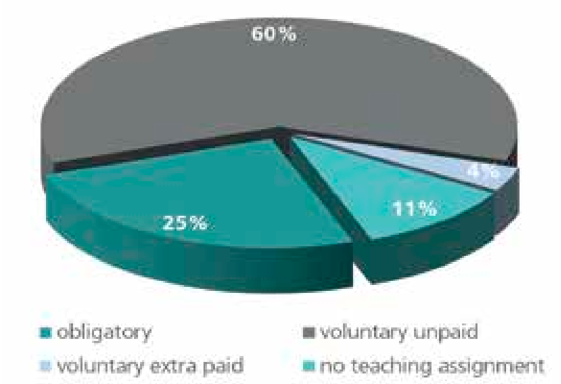


Fig. 6: Teaching assignment

illustrate this. YIN members gave lectures accounting for a total of 169.5 weekly teaching hours per semester (SWS) during the past winter (2019/20) and summer semester (2019). The 169.5 SWS comprised lectures (120.5 SWS), seminars (30 SWS), exercises (9 SWS) and practical trainings (10 SWS). Interestingly, however, only 25% of the YIN members have an obligatory teaching assignment. For 60% the teaching assignment is completely voluntary and mainly unpaid. (Fig. 6)

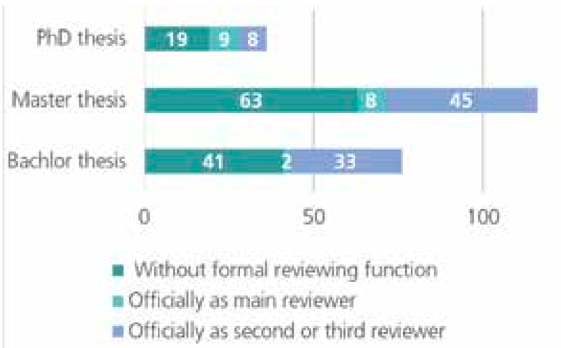


Fig. 7: Number of thesis supervised by YIN members in 2019

In addition to teaching, YIN members supervise PhD as well as Master and Bachelor students. In 2019, 36 doctoral thesis, 116 Diploma and Master thesis as well as 76 Bachelor thesis were prepared in YIN research groups, as is illustrated in Fig. 7.

Unfortunately, the examination entitlement granted to YIN members is not the same across KIT Departments. Only 8 % of the YIN members have full examination rights and roughly 6 % of the YIN members have no examination entitle-

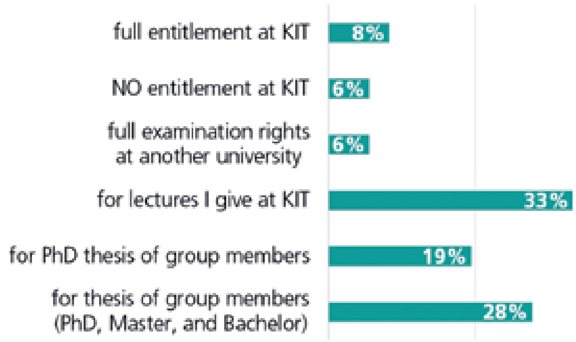


Fig. 8: YIN examination entitlement

ment at all. This is problematic given the fact that many of these YIN members at the same time teach independently. Roughly 28% of the YIN members have examination entitlement for thesis of group members (PhD, Master, and Bachelor students); another 19% for PhD thesis of group members and 33% for lectures they give (Fig. 8).

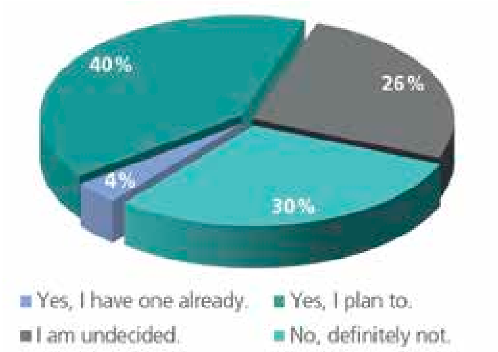


Fig. 9: Status and view regarding the habilitation as seen by YIN members.

Habilitation

The status of a junior group leader (Nachwuchsgruppenleiter mit Prüfungsberechtigung) was once thought to replace the habilitation. However, the significance of the habilitation versus a junior group leader position is perceived differently across disciplines, KIT departments, universities, and countries. In 2019, 40% of the YIN members planned to pursue a habilitation and 4% have already successfully completed this process. 26% were undecided while 30% considered the habilitation unnecessary for their career. This is a significant increase over previous years and the largest percentage ever recorded who did not want to pursue a habilitation. This perhaps reflects a change in attitudes over time.

Publications and conferences

A total number of 188 papers have been published in 2019 by the 27 YIN members that participated in this survey. This includes publications in presti¬gious journals such as Physical Review Letters, Journal of the American Chemical Society, Chemical Science, and Nature Communications. The average Hirsch-index of a YIN member is h = 18. Due to different publication traditions in different disciplines, the h-index of the YIN members varies significantly and should therefore not be considered as an accurate performance metric between disciplines. In addition to publications, YIN members show their scientific work and represent KIT on numerous occasions. In 2019, they presented their work at 102 international conferences. Furthermore, 4 patent applications were filed by YIN members in 2019.

Distribution of working hours

Unsurprisingly, the time that young YIN group leaders spend on independent research and writing papers decreases as their duties expand. All YIN members have personnel responsibility and on average devote 27% of their time to supervising and mentoring, In addition, they spent 14% of their time for teaching, and 10% for grant writing, which are important building blocks for the careers of YIN members. Furthermore, administrative duties and committee work increase. These take 20% of their time on average.

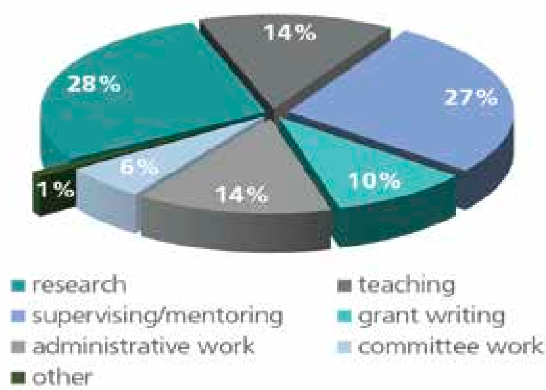


Fig. 10: Distribution of working hours of YIN members

ERC Consolidator Grant "The Actinide Bond" – 5th ERC for Helmholtz group leaders at KIT

Actinides are radioactive elements needed for specific cancer treatment or new remediation methods for radioactively contaminated areas. For her ERC project "The Actinide Bond – Actinide Bond Property in Gas, Liquid and Solid State", YIN alumna Dr. Tonya Vitova concentrates on the relationship between covalency and the strength of the chemical actinide bonds. To this end, she combines synchrotron radiation-based X-ray spectroscopy methods with quantum chemistry calculations. Within YIN, she is the 14th ERC grantee and the 5th Helmholtz group leader to secure an ERC grant.

Nature Catalysis: Operando X-ray spectrotomography shows 3D view of catalysts in action

Catalysts accelerate chemical reactions in order to reduce energy consumption and undesired by-products as in emission control. "To understand how these materials function, we need to look into the reactor when the catalyst is working," says Dr. Thomas Sheppard. With a newly developed setup for operando X-ray spectrotomography, his team succeeded in tracking the complex 3D structure of an active catalyst in cooperation with the Paul Scherrer Institute (Switzerland) and the European Synchrotron Radiation Facility (France). The results are published in Nature Catalysis: doi 10.1038/s41929-020-00552-3

YIN Grants 2020

Modelling the Microstructural Volume Variations and the Resulting Mechanical Properties in Lithium-Ion Battery Electrodes
Dr. Dominic Bresser and Prof. Katrin Schulz

Determining molecular orbital energies in supramolecular donor-acceptor complexes combined with data digitalization
Dr. Julia Maibach and Dr. Frank Biedermann

openCARP-XL
Dr. Hartwig Anzt and Dr. Axel Loewe

EU Commission now funds research within the European University EPICUR

KIT coordinates the "EPICUR Research" project which will integrate research activities and interaction with society into the "European University" EPICUR (European Partnership for Innovative Campus Unifying Regions). The aim is to initiate and implement novel research alliances between the eight EPICUR partner universities from six countries. YIN members participated in the internal review process of the application and will be on the EPICouncil acting as a sounding board. EPICUR research complements the teaching and learning activities that started in 2019 with the goal to create an inter-university campus. At the Kick-Off event on 19 January, 2021, Dr. Somidh Saha represented the interest of young investigators.

KIT Senate approved guest seat for YIN representative

For the first time, a representative of the independent junior research group leaders and junior professors at KIT has been welcomed as permanent guest into the KIT Senate. With this decision, the senators give credit to the strategic importance of this target group. As newly elected representative YIN speaker, Dr. Hartwig Anzt will size the chance to increase the consideration of junior staff and add their practical knowledge and experiences to the senators' debates. YIN Deputies are Karsten Woll and Katharina Scherf. The KIT Senate issues an opinion on the structural and development plan of KIT as well as on the drafts of the economic and the finance plan.

Hartwig Anzt shares a few aspects: For me, as a Young Investigator Group Leader, the guest seat in the KIT Senate is a unique opportunity to experience how university politics work. Even though I always thought I have a good idea how a university operates, attending the discussions and presentations in the KIT Senate opened my eyes: There are often many more aspects and metrics to consider when making a strategic decision. The KIT Senate's discussions are a colorful picture representing the challenge of satisfying all interest groups in a research institution with more than 8,000 employees.

YIN Day 2020 with Prof. Rebecca Harrington – a successful hybrid event

The two highlights of the day were a science walk through the Hardtwald and an invited talk by YIN alumna Rebecca Harrington, professor at the Ruhr University Bochum. During the walk, YIN members and alumni presented their research in short pitches. Between each station, there was plenty of open space for discussion and networking. The first ideas for joined projects have, thus, been born. Rebecca Harrington's talk on "Using atypical seismic signals to understand the earthquake problem" concluded the afternoon's online program. Atypical earthquakes occur in unusual depths in the fault zone or away from active plate boundaries.

Compostable displays for sustainable, environmentally friendly electronics

Electronic waste that is biodegradable? For printed displays, it has become a reality. Dr. Gerardo Hernandez-Sosa's group used biocompatible materials of mainly natural origin for this purpose. The inkjet printing process also enables customised, cost-effective and material-efficient production with high throughput. Sealing with gelatine makes the displays adaptable and adherent. Thus, they can be worn directly on the skin and are suitable for use e.g. in medical diagnosis or food packaging. The researchers published their results in the Journal of Materials Chemistry.
doi: 10.1039/d0tc04627b

Temporary contracts – the „12-year-rule“

During their qualification phase, young scientists in the German academic system usually work on temporary contracts. The Federal Law (on fixed-term contracts) grants them a maximum of 6 years to get their doctorate and another 6 years afterwards. For the straightforward career, it sounds simple enough. Life, however, seldom moves in a straight line. There might be detours abroad or side trips to industry, parental leave or part-time work disagreeing with tightly scheduled careers. And right there, it gets tricky. The possibility of exemptions and extensions vary strongly depending on the type of contract and the underlying set of laws and regulations. The corona pandemic and the corresponding restrictions have hindered scientific progress and made the diversity and incongruity within the jungle of regulations once again painfully apparent.


©KIT

The 12-year-rule

At an academic institution of higher education in Germany, you basically either work as a academic employee under the federal law or as a public official ("Beamter") under the respective state law. The latter mainly comprises professors and academic officers ("Akademische Räte"). As mentioned above, the federal law allows working on temporary contracts up to 12 years in total. Most doctoral researchers also work as academic employees on temporary contracts. If they don't need the full 6 years allowed for this career step, the difference in time is added to the 6 year span attributed for further qualification after the doctorate: e.g. if doctoral researchers get their degree in 4 years, they may work up to 8 years (6+2 years) on fixed-term contracts afterwards.

The State University Law in Baden-Württemberg correlates with the federal law in restricting the career path for junior professors likewise to 12 years: it states that to qualify for a junior professorship, the phase of academic employment prior to and after the dissertation may not exceed six years overall. Thus, before reaching the 12-year-mark, there is enough time left for the 6-year-term of a junior professorship. With a temporary position as "Akademischer Rat", it is a different story. So long as it still serves the purpose of further qualification towards a habilitation or an equivalent, it may be set on top of any previous employment as academic employee – even if the 12 years are exhausted. Following a junior professorship, however, such an argumentation proves to be problematic: as a positive end evaluation already qualifies for a full professorship.

Doctorates spent abroad or on a scholarship

What about doctoral researchers whose studies were funded by a scholarship or accomplished abroad? Do they get the full 6 years on top, as they have not spent any time working at an academic institution of higher education in Germany, yet? Not generally. The time spent on the doctorate counts whether doctoral researchers are employed or not, whether they study in Germany or abroad. Added is the time spent working on a fixed-term contract as an academic employee at a German university or research institution that does not overlap with the doctoral phase and amounts to more than 25% part-time work. Here now, the phrasing is quite specific. Thus, temporary work at a research institution abroad or in industry will *not* count towards the 12 years. This is true, not only for academic employees, but also for public officials.

Doctoral studies always count towards the 12 years

12+ years: extra time for child care

On average, academics get their first position as full professors in Germany at the age of 42. Hence, the qualification phase more often than not coincides with starting a family. The most prominent reason for extension, therefore, is child care. The federal law for scientific employees allows up to two years extra for the supervision of each child under the age of 18 living in one household with the parent – adding up to a maximum of 4 years. For public officials, it is 2 years for each child under the age of 14. These years, however, only come on top of the 12 years allowed to work in temporary positions. It does not mean that the employer has to extend the work contract.

In contrast, the time that is actually spent on parental leave has to be added to the duration of a fixed-term contract. This includes phases of part-time work reduced by at least a fifth. How does this work out in practice? The possible scenarios are quite flexible as long as the working hours add up. Let's assume that work hours are reduced by one fourth over a year. The contract, then, may be extended by one year working 25%, three month working full-time, or anything in between like working 50% for half a year. Universities and funding agencies are generally quite willing to accommodate the parents' needs.

12+ years: extra months for corona standstill
No one was prepared to deal with the corona pandemic, when it first hit society in March 2020. Laboratories were closed, conferences canceled, application processes halted, and child care has almost completely broken down. Thus, junior professors and junior group leaders all over Germany – all over the world really – experienced difficulties to achieve the goals set for their evaluations in time. In Germany, the federal government addressed the issue by passing a new law on May 25th.[1] Together with the amendment[2] from September 23rd, it now allows an extension of the 12-year-limit up to 12 months for academic employees who have been working on temporary contracts between March 2020 and April 2021. Shortly afterwards respectively, the State of Baden-Württemberg adapted the regulation for academic officials accordingly.[3] It is, however, in both cases up to the universities on which premise they grant an extension and how they finance it. This is quite unfortunate. Young academics, especially those with children, are severely afflicted by the pandemic and need immediate support and planning security. The German Association of University Professors and Lecturers (DHV), besides others, has published a statement asking for scientists with child care responsibilities to get an extension without the burden of further proof.[4]

Field report: German rules shrouded in mystery
The 12 year rule affects most PhDs and Postdocs working in Germany, yet to many it remains shrouded in mystery. Particularly if you come from abroad, there is a chance you have never even heard of it. Unfortunately, the 12 year rule doesn't care if you have heard about it or not, it still lies in wait, ready to crush your dreams of taking a junior professor position (if you are lucky enough to find one), disrupt your postdoc career, or force you to change jobs or cities even if you don't want to. What valuable lesson can we draw from this confusion? Stay on top of your career planning, especially if transitioning to a new role or new country where rules can be different. Always have a thought for the next steps, get in touch with the career service, and talk to supervisor or colleagues.. Use the information sources available to you. Particularly brave individuals could try to get to grips with the German bureaucratic system by themselves, but some would say: life is too short for that.

Last resort: work on third party funding
When everything else fails, there is in some cases still the option to work on third-party funded projects: However, not only has the own position to be financed by such a project, but also the major tasks need to be directly related to it. Thus, there is a specific scientific goal to be achieved in a certain time which justifies temporary employment. Accordingly, there are quite a number of academic employees well beyond the 12-year-limit who continue working on one third-party funded project after the other.

[1] Cf. Gesetz zur Unterstützung von Wissenschaft und Studierenden aufgrund der COVID-19-Pandemie, Artikel 1
[2] Cf. Bundesgesetzblatt Jahrgang 2020 Teil I Nr. 43, ausgegeben zu Bonn am 30. September 2020, p. 2039.
[3] Cf. Landeshochschulgesetz Baden-Württemberg §45 (6a) and Gesetzblatt Nr. 46 vom 30. Dezember 2020 des Landes Baden-Württembergs.
[4] Cf. www.hochschulverband.de/fileadmin/redaktion/download/pdf/resolutionen/Forderungen_Corona-bedingt_11.05.2020.pdf
Further Information in German:
www.forschung-und-lehre.de/recht/die-zehn-haeufigsten-irrtuemer-ueber-das-wisszeitvg-677/
www.forschung-und-lehre.de/das-andere-befristungsrecht-258/

Working on temporary contracts at KIT

KIT as a state university and a federal research center also has its own set of regulations

KIT was founded in 2009 as the first and until this day the only fusion of a state university and a federal research center in Germany. Based on this distinction and in addition to it, KIT has a unique set of prescribed and self-determined regulations defining temporary work contracts.

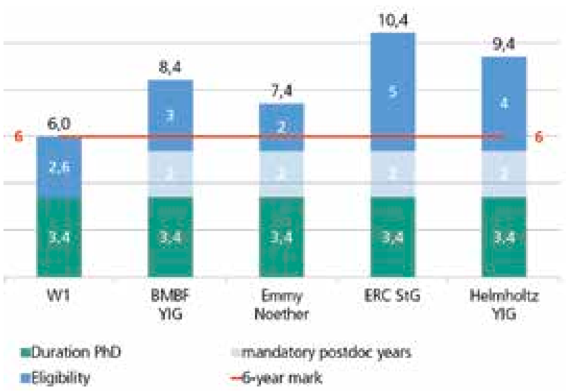
3-year postdoc phase

The definition of postdocs varies throughout the academic system. At KIT, a postdoc has earned a PhD, obviously, but has not yet continued to the next career step which might be a junior professorship, a junior research group leadership, the registration of a habilitation, a project-related activity, or a permanent position as scientist.[1] While this postdoc phase should not exceed 3 years at KIT itself, it may be in line with postdoc stays at other universities before or afterwards.
Dr. Britta Trautwein, head of the Karlsruhe House of Young Scientists (KHYS) at KIT describes the idea behind this concept: "For young academics, it is very easy to get lost in the daily work routine. During their 3 years at KIT, we want postdocs to actively think about their future career and take the appropriate steps towards this goal. To stay in science, they have to become more independent, write their own papers and proposals, and take on leadership responsibilities."

W1 position for externally evaluated group leaders – until half of the group's duration

Universities throughout Germany compete in attracting awardees of prestigious external funding schemes such as ERC grants, Emmy-Noether groups, BMBF or Helmholtz young investigator groups. Important assets to win these excellent young scientists are the status and the future perspectives associated with a junior professorship – especially with tenure option. Most funding agencies welcome the idea of their grantees being appointed as junior professors.[2]

There is, however, the tiny problem of compatibility: the State University Laws asks of junior professors that their phase of academic employment prior to and after the dissertation may not exceed six years in total. Even excellent PhD students that acquire an Emmy Noether group later, need on average 3.4 years to get their degree.[3] Thus, they can only afford a relatively short postdoc phase before reaching the 6-year-limit for junior professorship. To become eligible for a prestigious junior research group, however, the funding agencies generally ask for a postdoc phase of at least two years to develop scientific independence and gain substantial international research experience. Since the external evaluation process and the appointment also take their time, it is almost impossible to stay below the 6-year-limit.

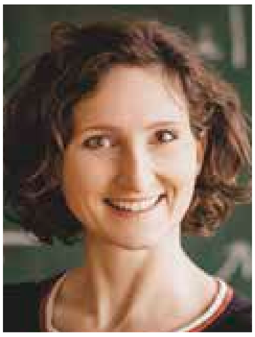


Duration in years between start of doctoral studies and end of eligibility phase for respective funding schemes.

KIT has successfully tackled the issue to combine an externally awarded group leadership with a junior professorship: As the quality assurance concept for junior professorships with tenure track at KIT states, excellent, externally evaluated group leaders just have to be in the first half of their funding period to still qualify for a junior professorship. For them, the 6-year-limit is successfully rescinded.[4]

[1] *Cf.* KIT 2025 https://intranet.kit.edu/downloads/kit_2025_strategiepapier.pdf (p 32)
[2] Cf. Hot Toplc – Interviews with the main funding agencies. In: YIN Insight 2017/18, p. 8-13.
[3] Cf. http://www.forschungsinfo.de/publikationen/download/working_paper_3_2008.pdf (Tab. 5) and
[4] Cf. §1 (6) www.sle.kit.edu/downloads/AmtlicheBekanntmachungen/2019_AB_001.pdf

The Geometry of Big-Data Clouds



Prof. Petra Schwer
mathematics

Clouds remain one of the largest puzzles in climate science. A new generation of climate models promises to enable fundamental new insights into how clouds couple with the circulation and shape climate change. However, these new models also pose challenges in terms of their unstructured grids and the amount of data they produce. Thus, we, Petra Schwer and Aiko Voigt, have joined forces to apply methods from pure mathematics for the analysis of cloud structures simulated by the new unified ICON climate model system. With the help of the YIN Grant and two student assistants, we have managed to develop a first prototype for identifying three-dimensional cloud structures on the native triangular grid of ICON.

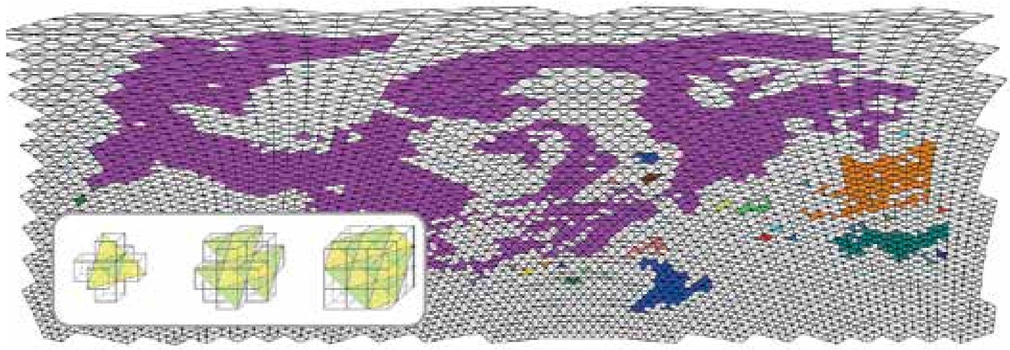
Aiko (now Professor for Climate Science at the University of Vienna) is a climate dynamicist and modeler. In his BMBF-funded young investigator group at KIT, he has applied new storm-resolving simulations to study clouds. In contrast to traditional climate models that use structured latitude-longitude grids with resolutions of around 100 km, these models use unstructured grids with much finer resolutions. For the employed ICON model, it was a triangular grid with a resolution as fine as 2 km. In addition to the massive increase in model data, the unstructured nature of the triangular grid challenges the analysis of coherent cloud structures and their geometrical properties. Established tools for connected component labeling on structured latitude-longitude grids can no longer be applied. This is exactly where Petra has come in. A former junior professor at KIT, she is now Professor for Geometry at Otto von Guericke University of Magdeburg.

We started talking about the ICON model challenges during a YIN workshop on interdisciplinary collaboration in 2018. Soon, we realized that current methods from geometric group theory might provide a solution: A cubulation method turns complicated spaces with walls into complexes built entirely out of unit cubes. These are easier to study, while still carrying a lot of the same information.

Prof. Aiko Voigt
climate science

In our joint project, we have translated the question of determining connected components of clouds on the ICON grid to the question of finding connected components on a 3-dimensional structured grid, where one can use existing connected component labeling tools. With the support of two brilliant student assistants, Nicole Knopf and Noam von Rotberg, we first developed a method to identify two-dimensional cloud components from a simulation of a North Atlantic cyclone. We later extended the method to three dimensions. Thus, our prototype can for example be used to identify the coherent slanted cloud structure that is generated by the upward motion within a cyclone.

The project was further supported by later funding from the KIT Center *MathSEE: Mathematics in Sciences, Engineering, and Economics*. A scientific publication on the method and the software is currently in preparation. We have also made initial contact with colleagues from other geoscience disciplines that might benefit from our approach.



Using the cubulation method, triangulations of the plane were transformed into cubulations of 3-dimensional space as illustrated in this figure. (Figure: Petra Schwer, Aiko Voigt)

Effectively communicating Bank Policies – how to best reach ordinary households

Dr. Daniel Hoang
Economics

Since policymakers reduced interest rates to zero, there has been growing interest in better understanding and utilizing economic policies that operate through their effects on household expectations. In this context, policy communication has become a crucial instrument in central banks' toolboxes. The unprecedented challenge: How to reach ordinary households, who do not understand and are not interested in policy statements? To tackle this question, the aim was to use an innovative methodology: Randomized control trials with information treatments for a large representative population of more than 5,000 participants. However, the feasibility of the research design was unclear ex ante. With the YIN Grant 2019, I was able to pretest the research design, cover initial start-up costs, and attract third-party funding.

In the study, we randomly provided two groups of Finnish citizens with different forms of communication regarding the policies the ECB had implemented to counteract the negative shock of the COVID-19 crisis:

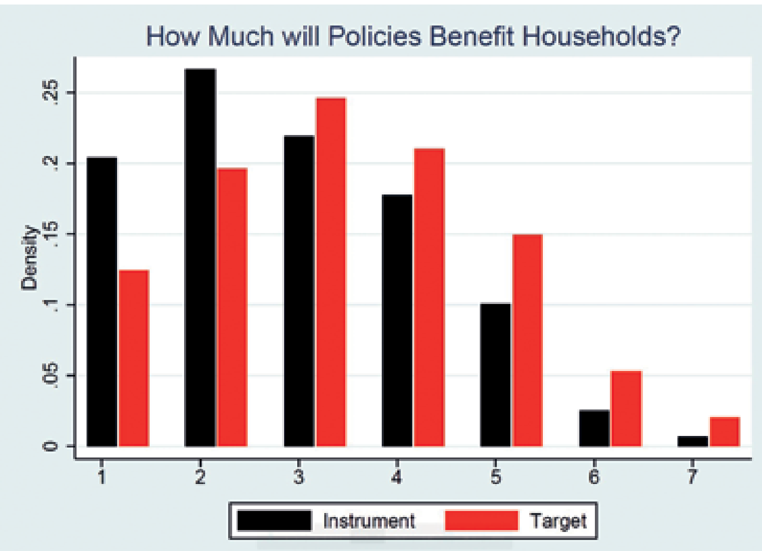


Fig.[1]: Target versus instrument communication show the distribution of answers to the question whether respondents think that the policies proposed by the ECB to overcome the COVID-19 crisis will benefit households from (1) not at all to (7) a lot.

(1) *Target communication*, which emphasizes policy objectives rather than details of the programs: "The ECB will do whatever is necessary to minimize the financial damage to citizens caused by the corona crisis."
(2) *Instrument communication*, which emphasizes the policy instruments adopted: "The ECB launches a EUR 750 billion Pandemic Emergency Program."

We find that target communication is substantially more effective in increasing income expectations, and hence consumer confidence (see figure). This is especially true for the less sophisticated groups in populations with rather limited cognitive abilities. They are often least aware of economic news and less able to interpret the traditional (technical) central-bank communication. In addition, the group with the most pessimistic income expectations during the crisis reacts most positively to target communication. They benefit most from avoiding the vicious circle of lack of consumer confidence and drop in aggregate demand that prolong economic crises.

Overall, the results indicate that monetary policy communication can be a successful policy tool to manage ordinary households' expectations. However, this effectiveness is highly enhanced when central banks emphasize the targets and aims of their policies rather than the specific policy measures with which they want to reach such aims.

Two years after receiving the YIN grant, the randomized control trial is completed (despite COVID-19), a working paper has been published, and the Fritz Thyssen Foundation has granted funding.

Cf. D'Acunto, Hoang, Paloviita, Weber. Effective Policy Communication: Targets versus Instruments (October 15, 2020). University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2020-148. http://dx.doi.org/10.2139/ssrn.3712658

How Weather Regimes Influence Cold Dark Wind Lulls in Future Power Systems

Dr. Tom Brown
informatics

More and more countries have committed to becoming climate neutral over the next few decades. Many have decided to base their energy systems around renewable sources thanks to their fast-sinking costs. However, if they rely on wind and solar for their power generation, these countries need to have a plan for the multi-day periods when the wind barely blows and the sun rarely shines. To this end, Tom Brown and Christian Grams joinec their expertise to understand of how these dark wind lulls ("Dunkelflauten") relate to long-lasting continental-scale weather regimes. This knowledge could help power system operators to better predict and mitigate these conditions.

Tom Brown builds computer models of the future energy system. He had identified dark wind lulls as one of the leading causes of high costs in scenarios with high shares of wind and solar energy, particularly when low temperatures lead to higher heating demand. Batteries can store energy for several hours but are not sufficient for the many days of storage required in the European winter.

Christian Grams, as a meteorologist studying weather regimes, was interested how the regimes could be related to these periods of high stress for the energy system. Weather regimes describe the dominant weather patterns over Europe and are classified into seven major groups, each with different properties affecting pressure, temperature and precipitation. Mapping weather regimes to dark wind lulls could unlock a better understanding of their underlying causes.

To tackle this issue, Tom and Christian teamed up with their group members Fabian Neumann and Julian Quinting. Within this team constellation, physics student assistant Fabian Mockert, funded by a YIN Networking Grant, was able to show that three of the seven weather regimes dominated the periods with dark wind lulls relevant for the German power system. They all correspond to 'blocked' (anticyclonic) situations but with different locations of the blocking high pressure systems: one has a high pressure system centered over Germany, while the other two situations correspond to a pressure saddle point over Germany between high and low pressure systems.

Dr. Christian Grams
atmospheric sciences

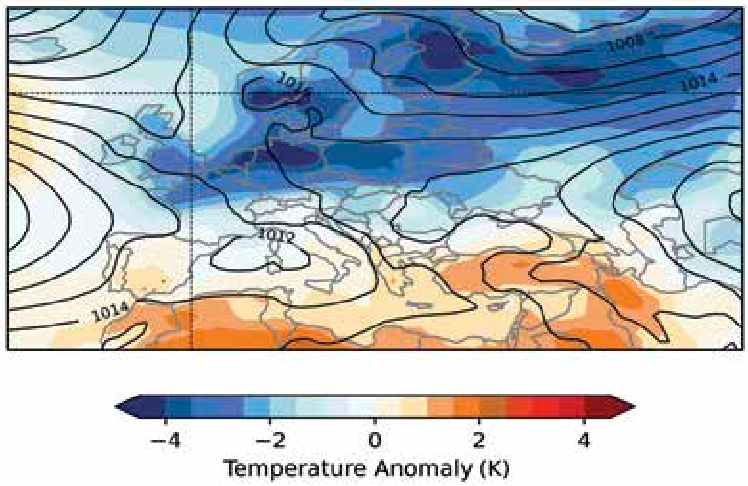
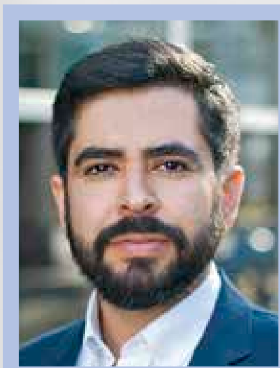


Fig.: Weather situation during a cold "Dunkelflaute" in Germany associated with a Greenland blocking regime. The contours of mean sea level pressure (every 2 hPa) indicate a pressure saddle point over Germany. This leads to low wind conditions and at the same time temperatures at 2 metres above ground are up to 4°C lower than normal.

All three cause low wind speeds over the North and Baltic Seas, which is the driving factor causing the dark wind lulls. One regime in particular coincided with cold spells (see figure). These results are being written up into a scientific publication and will serve as the basis for a project application to explore how climate change affects the relation between weather regimes and the power system.

Continually towards Leadership Excellence

Insights from the tailor-made advanced training program exclusivly for YIN members



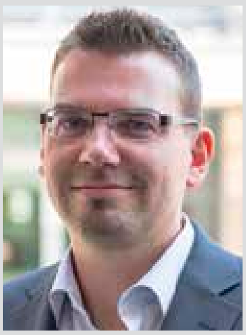
Deliver your message – transform your audience
by Dr. Gerardo Hernandez-Sosa, BMBF

Being able to efficiently present your research and yourself is a necessary skill to cultivate as a scientist, especially on an early career stage. Furthermore, the increasing multidisciplinary in all research fields and the current need to clearly communicate science to the general public can become somewhat challenging as the content, message and delivery of presentation need to be adapted for each audience. To prepare for this tasks, me and nine other YIN members attended the workshop "Deliver your message – transform your audience".

Over two days, the instructor introduced us to different presentation techniques. Aided by her background in acting, she guided us through the elements that compose a story and the storyboarding process. From day one, warming up exercises and interactive activities helped us gain confidence on identifying and creating the "presenter" personality that would effectively deliver the message to a specific audience. Of equally importance were the delivery techniques: the significance of posture, pauses, and stage management. All participants had the opportunity to prepare and present a short talk during which we received personalized coaching, feedback, and advice on how to overcome bad habits and further develop existing skills. The workshop helped us to gain confidence in adapting our style by expanding our presentation toolbox and realize that the best way to prepare for a presentation is to focus on how to reach the audience. For me, this was input that I have been able to put in practice right away and has made a different in the way I approach public speaking.

YIN Certificate *Academic Leadership*

After various seminars, workshops, and coaching – mounting up to 200 academic units – Dr. Hartwig Anzt and Dr. Manuel Hinterstein have proven themselves as exceptional leader personalities. At the hybrid YIN Day 2020, they were virtually awarded the Certificate *Academic Leadership* by Ernst Aumüller, head of the Leadership Personnel and Top Management section at the Service Unit for Human Resources at KIT.



"The YIN Advanced Training Program contributed a significant part to my professional development," says Dr. Manuel Hinterstein (photo on the left). "Especially the leadership excellence course was helpful to learn more about human resources management and how to deal with the peculiarities in academic leadership. Since YIN is composed of researchers with a similar vita, the collegial counseling also plays an important role and direct discussions help getting information from different angles. The program is a real benefit for all YIN members and the coordinator Anka Schneider led it through the Corona crisis fantastically.

Interim Review goes digital
by Dr. Thomas Sheppard, KIT JRG

2020 brought many changes to all aspects of life. Within YIN, the interim review meetings are a kind of get-together or meet-and-greet for the newer members and a regular progress report for the YIN veterans. From their usual cosy small group format, they were shifted to the initially impersonal context of a Zoom room. However, it is the people who make the atmosphere.

Thus, despite what was clearly an unusual and unfamiliar environment for the YIN members and counsellors, the review meeting soon felt like the most natural thing in the world: A great opportunity for a heart-to-heart in a small group of colleagues and peers within YIN. A safe space to share dreams, worries, and ideas. An opportunity to reflect and to look forward to the next career steps. Make sure not to miss out on the interim review meetings (physical or virtual) and try to get one at least once a year. You owe it to yourself to take a break from the hectic tenure or group leader phase, chill out and take some time to pause and reflect.

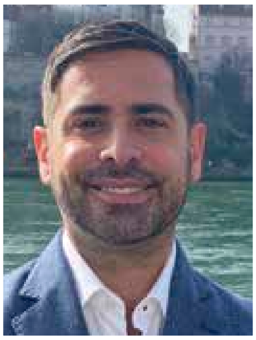
Digital Self-Marketing
by JProf. Julian Thimme

The image of scientists conducting research on their own in a quiet room is outdated. Research results want to be made available to a broad public. Fortunately, the digital age provides a multitude of possibilities to do so. The one-day workshop "Digital Self-Marketing", which of course took place online, gave a good overview of the most suitable platforms for this purpose. As a starting point, the 10 participating YIN members discussed the personal goals for their digital presence. In addition to the communication of research results, increasing the visibility of the research group was also mentioned as very important.

In small groups, we then looked at the online presence of some people who were more or less involved in research, but who all had elaborate websites and social media profiles. The discussion of these practical examples revealed key aspects of online communication and mistakes that should be avoided. Interestingly, the assessments of the workshop participants were sometimes very different, pointing towards the fact that the optimal form and style of digital presence is a very individual decision. In the course of the workshop, the focus then turned to different communication channels, in particular the personal website, blogs, and social media such as ResearchGate, LinkedIn, Twitter, Instagram, Facebook, and TikTok. The coach highlighted how to effectively use these channels to increase visibility. Overall, the workshop showed that the decision for or against certain forms of communication is very individual and that digital presence is always a trade-off between effort and benefit.

From academic to pharmaceutical research

An interview with YIN alumnus Danilo Maddalo, team leader at *Genentech*



Dr. Danilo Maddalo
Team leader at Genentech

Following his curiosity, Danilo Maddalo has always gone where his research interests took him. Starting off in Italy, he joined KIT in 2006 with a PhD fellowship from the European Commission. After earning his doctoral degree in molecular biology and biochemistry in record time, he successfully applied for a Young Investigator Group (YIG) at KIT studying stress response in prostate cancer. In 2012, his career took another turn, when he accepted a research position at the Memorial Sloan-Kettering Cancer Center in New York, US. Three years later, he crossed the Atlantic again to work for the Novartis Institutes for BioMedical Research in Basel, Switzerland. In 2020, he finally took up an offer from Roche/ Genentech, where we can still find him searching for cancer therapies today.

What fascinates you about cancer research?
Cancer is a very complex disease that, unfortunately, ends up being part of the life of each of us – directly or indirectly. The ability of this disease to evolve and adapt to therapy poses serious challenges from the medical point of view and at the same time represents a fascinating scientific challenge.

Why did you choose KIT for your PhD?
Even if medicine is not the major focus, KIT offers a unique platform where multiple disciplines are at the same interface, generating a unique synergy. I believed (and I still do) that an interdisciplinary approach increases the chances of success for a research project and in such terms KIT is at the forefront, in Europe and beyond. Another point was the positive impression I got from my PhD mentor, Prof. Andrew Cato, who was able to pass on his energy and passion for science.

Interdisciplinarity increases the chances of success

When you applied for the YIG, were you thinking of following an academic career?
I have learned over the years that we have very little control on our career evolution and it is all dictated by the type of opportunities presented and the timing. When I applied for the YIG, I thought that an academic career was the most natural progression. However, the lack of a clear tenure track kept my path more open. I think that it allows YIG leaders to evolve professionally without being necessarily restricted to academia.

Why did you leave KIT after only two years into your group leadership?
Part of the program included the possibility to visit another institution, putting the position at KIT on hold for one year. That's what I did when I visited Memorial Sloan Kettering Cancer Center in New York City, one of the top cancer centers in the world. The timing was almost perfect: a few months after I joined, a new technology started to rise: it was the CRISPR/Cas9 system – the "genetic scissors" for which the Nobel Prize in Chemistry was awarded in 2020. I was among the firsts to apply the technology in vivo for the generation of animal models of disease and eventually to design innovative therapies. At the end of the year the data looked encouraging so I decided to stay on and left the position at KIT.

What about your research project at KIT?
I was very lucky to work with a group of smart and enthusiastic people and I managed to publish a paper with each of them. It was a good way to set a clear cut and allow them to explore other job opportunities within or outside KIT.

From a university in Germany to a clinical research center in the US – what is different?
A clinical research center has a stronger patient-centric approach when addressing key scientific questions and it offers more opportunities to interact with clinicians. On the other hand, a technology oriented German university presents more interdisciplinary interactions. In both cases it is possible to perform very interesting science.

Why did you return to the European continent to work in the pharmaceutical industry?
The possibility of having my own research lab in a large pharmaceutical company in Europe seemed the best decision for me, as I would have been active in the pre-clinical drug development process. Also I could have eventually applied my years of academic experience in a more translational setting.

Did you profit from your experience as YIG leader, particularly as the head of a lab?
The YIG leader position influenced deeply my career and I still feel extremely privileged for the opportunity I had back then. Becoming a YIG leader helped me grow in my role as a manager, strategic thinker and scientist, it helped me expand my network and gave me the opportunity to develop various soft skills. In other words, it was a refining moment both personally and professionally and the benefits extend beyond my time in Germany.

The YIG helped me grow in my role as manager, strategic thinker, and scientist

How do you compare leading a research group in academia and industry?
In principle, I managed my lab at KIT and in industry by putting science, curiosity, and challenge of the status quo at the center. So, these are surely the main similarities. Of course, academia and industry have slightly different missions, both relevant. In academia there is more drive towards basic scientific questions, while industry has a clear traction towards translational discoveries that can be directly applied to the patients.

Moreover, in industry the research group is often part of a large team effort, where chemists, biologists, pharmacologists, and bioinformatics get together to push the program forward. Unfortunately, this is often not the case in academia, even if, as I said, I believe that institutions like the KIT hold the great potential of making this happen more frequently.

Another difference is, of course, the funding: in industry grant writing is not required even if projects can swiftly change according to the needs and the competition.

You continue to work for a big pharmaceutical company, what do you appreciate most?
Pharmaceutical companies and in particular my current position offer the possibility of addressing scientific questions that will directly impact the patients. I am also actively involved in the drug discovery process, starting from the very early stage down to the filing with the health authorities: A path that is very often full of challenges, even if it is extremely rewarding to know that, ultimately, it will benefit the patients.

Would you consider an offer to take up an academic career, e.g. a professorship?
Never say never. I always keep an open mind and I can surely say that I always welcome interdisciplinary, academic collaborations. I have already established a few collaborations with academics in the past and I am ready to welcome more (including the KIT of course). As far as the professorship, I guess it will highly depend on which type of opportunity is presented, when and if.

Where do you see yourself in 10 years' time?
Hard to say. Surely involved in science and innovation, hopefully at the forefront of technology development, keeping curiosity and data at the center of the stage.

Thank you very much!

Past and present: Danilo Maddalo today in Basel wearing a KIT t-shirt with the Roche towers in the background.

Straight forward towards professorship

An interview with YIN alumna and former YIN speaker Stefanie Speidel, now professor in Dresden

Prof. Stefanie Speidel
National Center for Tumor Diseases, Dresden

Stefanie Speidel's career has been exemplary. After studying computer science at the University of Karlsruhe, today KIT, and the Royal Institute of Technology Stockholm, she joined the research training group *Intelligent Surgery* for her doctoral studies. In 2009, she received her dissertation with honors. She stayed on as a post-doc and successfully applied for the Margarete von Wrangell fellowship by the State Baden-Württemberg. On this basis, she built up and led the independent junior research group *Computer-assisted Surgery* between 2012 and 2016. In 2017, she followed a call to Dresden to take on a full professorship for Translational Surgical Oncology. Her research encompasses computer- assisted surgery, intra-operative navigation and visualization of soft tissue. Stefanie Speidel has been the first professor at the National Center for Tumor Diseases (NCT), a joint institution of the German Cancer Research Center (DKFZ), the Technical University Dresden, the University Hospital Dresden, and the Helmholtz Center Dresden-Rossendorf (HZDR). Before moving to Dresden, she has been very active in the Young Investigator Network (YIN), first as speaker of the alumni committee and for the last one and a half years as representative speaker of YIN.

How well did your junior research group prepare you for a professorship?
In retrospect, I think I was quite well prepared since I had to establish my own group from scratch. This involved writing grant proposals to finance doctoral researchers, supervising students, publishing research, organizing workshops, teaching, and committee work. These are all tasks that come along with a professorship. In addition, the courses that YIN offered complemented my training regarding academic leadership for example.

You had a Wrangell habilitation scholarship – was the habilitation important?
The Wrangell fellowship was a great opportunity and gave me a lot of freedom to pursue my research. In the end, I got appointed professor before I finished my habilitation. In my field it is not necessary to have a habilitation. To be honest, I was more focused on building up my group, publishing, getting grants, teaching, and so on. In the end, my group included three doctoral researchers.

Group leadership was more important than a habilitation

I had acquiered the funding from different sources: While my own position was funded by the Wrangell fellowship, I financed the doctoral researchers partly from a project with the German Research Foundation (DFG) and partly over a project with the Klaus Tschira Foundation. Nowadays, there are many ways that can lead to a professorship and having an independent junior research group is one way.

Retrospect: Stefanie Speidel (m.) and her KIT junior research group in 2013. (Photo: private)

How did YIN help you along the way?
I think I benefited a lot from the advanced training program that YIN offered. I took several courses regarding academic leadership, had personal coaching, and interim reviews with peers which were quite informative. It was also helpful regarding the application process for a professorship including the negotiations. I also enjoyed the exchange during the meetings and the courses since it was always the same group at the same career level.

Stefanie Speidel (m.) and her research group at the National Center for Tumor Diseases (NCT) in Dresden. (Photo: private)

What benefits and challenges came with accepting the call to Dresden?
Dresden is an exciting research place in general, but for my research field it had the additional benefit that I'm at the university hospital campus with direct access to clinicians. I was also integrated in several collaborative research projects right from the beginning, e.g. an excellence cluster (CeTI), even before I started my new position officially. In addition, three researchers from Karlsruhe joined me when moving to Dresden which was a huge benefit since I did not have to search for new doctoral researchers. This is also another advantage of acquiring individual funding: The people working on the project are free to come with you.

Challenges that arose from moving to Dresden included, for example, building up collaborations, establishing the research lab including hardware infrastructure, attracting students, … – the typical challenges you encounter when coming to a new place.

What fascinates you about working at the intersection between computer science and clinical medicine?
I'm motivated by a specific clinical need that has the potential to be solved with data-driven methods and new technologies from computer science in order to improve patient outcome and therapy. In my opinion, interdisciplinary research is rewarding and broadens my horizon, but it also means leaving your comfort zone. The two fields differ not only in the topic itself, but also regarding education, culture, working environment, and style. For example, surgeons and computer scientist have to find a common language first to establish a mutual understanding of the different fields and associated challenges. I see myself as a bridge-builder at the interface between both fields.

If you could change one thing in your academic environment, what would it be?
Shorter committee meetings!

Where do you see yourself in 10 years' time?
I hope I'm still conducting interdisciplinary research with motivated students, I think this is the most inspiring part of my job.

What would you tell young women (and men) in science, being at a rather early career stage?
Take the opportunities and chances that are offered, I have the impression that women usually underestimate themselves and are too critical, don't fear failure and have courage to try something new, and build a supportive network.

Thank you very much!

Robot-assisted surgery in the experimental operating room of the NCT Dresden. (Photo: NCT/UCC/André Wirsig)

JProf. Yolita Eggeler
Laboratory for Electron Microscopy

Juniorprofessorship
Microscopy, Microstructure, Mechansims

Dr. Alexander Knebel
Institute of Funtional Interfaces

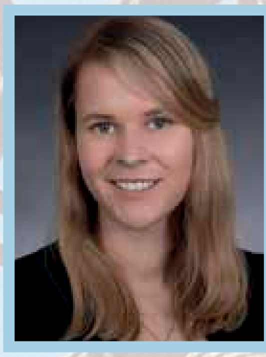
KIT-Junior Research Group
Porous Membranes and Sensor Materials

JProf. Pascal Friederich
Institute of Theoretical Informatics

Juniorprofessorship
Artificial Intelligence for Materials Sciences, AiMat

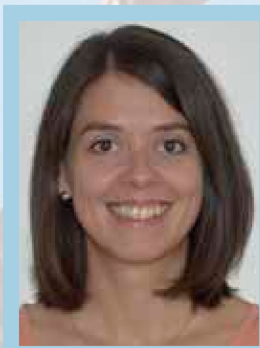
JProf. Fabian Krüger
Institute of Economics

Juniorprofessorship
Applied Econometrics



Dr. Emma Järvinen
Institute of Meteorology and Climate Research – Atmospheric Aerosol Research

Helmholtz Young Investigator Group
Airborne Cirrus Cloud Observations



Dr. Martina Klose
Institute of Meteorology and Climate Research – Troposphere Research

Helmholtz Young Investigator Group
Mineral Dust

JProf. Britta Klopsch
Institute for Vocational Pedagogy and General Pedagogy

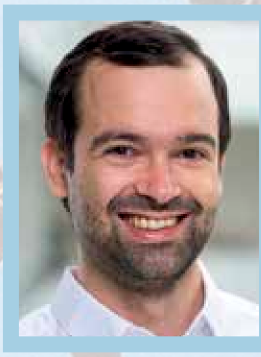
Juniorprofessorship
Education, School Pedagogy

Dr. Penelope Whitehorn
Institute of Meteorology and Climate Research – Atmospheric Environment Research

KIT-Junior Research Group
Climate and Land Use Change Impacts on Bumblebees

Dr.-Ing. Giovanni De Carne
Institute for Technical Physics

KIT-Junior Research Group
Real Time System Integration

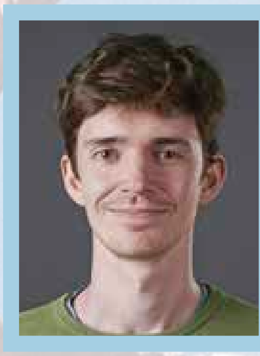


JProf. Claudio Llosa Isenrich
Institute of Algebra and Geometry

Juniorprofessorship
Complex Geometry and Geometric Group Theory

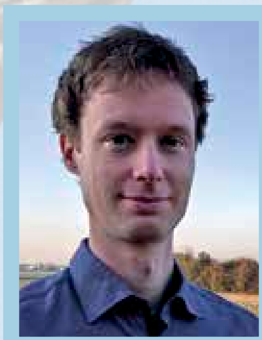
Dr. Barbara Verfürth
Institute for Applied and Numerical Mathematics

KIT-Junior Research Group
Numerical analysis of multiscale methods



Dr. Thomas Sheppard
Institute for Chemical Technology and Polymer Chemistry

KIT-Junior Research Group
X-ray Microscopy in Catalysis

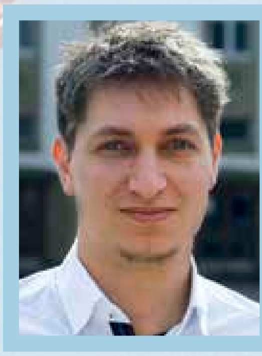


Dr. Sebastian Lerch
Institute for Stochastics

KIT-Junior Research Group
Artificial Intelligence for Probabilistic Weather Forecasting

Dr. Somidh Saha
Institute for Technology Assessment and Systems Analysis

KIT-Junior Research Group
Sylvanus



Dr.-Ing. Jan Haußmann
Institute of Product Engineering

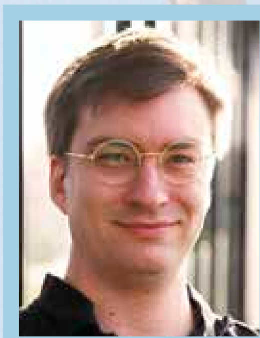
KIT-Junior Research Group
Sensor based Fuel Cell Development

JProf. Christian Wressnegger
Institute of Theoretic Computer Science

Juniorprofessorship
Intelligent System Security

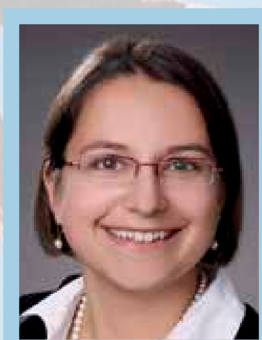
Dr. Philip Willke
Institute of Physics

Emmy Noether
Quantum Coherent Control of Atomic and Molecular Spins on Surfaces



JProf. Helge Stein
Helmholtz Institute Ulm

Juniorprofessorship
Applied Electrochemistry



Dr.-Ing. Ulrike van der Schaaf
Institute of Process Engineering in Life Sciences

KIT-Junior Research Group
Interfacial Properties of Pectin-based Biopolymers

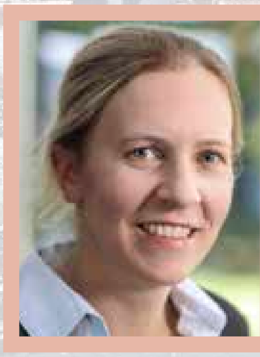
NEW YIN ALUMNI

JProf. Maribel Acosta
Assistant Professor of Databases and Information Systems
Ruhr-University Bochum

previously
Deputy Professorship
Web Science

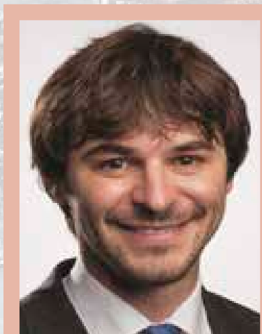
Prof. Anna Böhmer
Professor for Experimental Solid State Physics
Ruhr-University Bochum

previously
Helmholtz Young Investigator Group
Strain Tuning of Correlated Electronic Phases



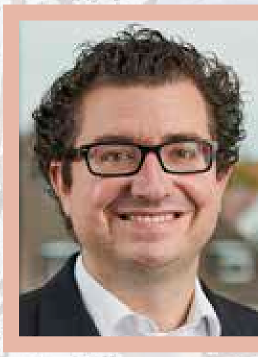
Prof. Katrin Schulz
Professor for Engineering Mechanics and Material Science
University of Applied Sciences Karlsruhe and KIT

previously
Margarete von Wrangell
Continuum Modelling of Dislocation Based Plasticity



Dr.-Ing. Benjamin Häfner
Group Leader Industrial IT
OPTIMA packaging group GmbH, Schwäbisch Hall

previously
KIT Jr RG
Agile Production Control Cycles



Prof. Philipp Schuster
Professor for Finance
University of Stuttgart

previously
KIT-Junior Research Group
Effects of Liquidity on Financial Markets

Prof. Aiko Voigt
Professor for Climate Science
University of Vienna

previously
BMBF
CONSTRAIn: Cloud-radiative Interactions with the North Atlantic Storm Track

Prof. Kathrin Valerius
Professor for Experimental Astroparticle Physics
KIT

previously
Helmholtz Young Investigator Group
Analysis of KATRIN Data to Measure the Neutrino Mass and Search for New Physics

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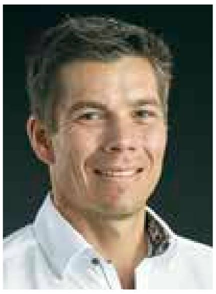
Karlsruhe, March 2021

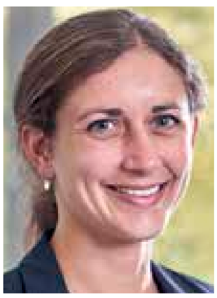
What we stand for

YIN connects independent junior research group leaders and junior professors on an early stage of their scientific careers. As in 2008, when YIN was initiated, we, the members, still occupy a very critical career niche between post-docs and tenured professors. As YIN, we speak with a single voice and our voice is heard. For example, YIN representatives are involved in the shaping of the upcoming Overarching KIT 2025 strategy, which aims to bring clearness into career perspectives of young scientists besides other issues. The continued existence of YIN is a testament to the role it plays within the academical hierarchy and to the services it provides for members. Our mission, comprised of the following three statements, has and will continue to guide YIN.


Dr. Hartwig Anzt
Representative


Dr. Manuel Hinterstein
Representative

We encourage each YIN member to become a better group leader. YIN members can take part in continuing education courses tailored to the needs of young group leaders in cooperation with PEBA. These courses include topics such as developing leadership abilities, improving research and teaching performance, as well as personal coaching. Rather than a static offering of courses, our members suggest and vote on desired themes to ensure that these courses directly meet their needs.


JProf. Katharina Scherf
Alumni

We represent the interests of independent young investigators at KIT. Young group leaders and untenured junior professors face an uncertain future given the changes in higher education politics, the academic landscape and leadership priorities at KIT. YIN represents our interests by working with and persuading the administration to best define our official standing, the supervision of doctoral students, and other rights and responsibilities. YIN has also hosted discussions with representatives from politics and various funding sources to understand and shape the policies affecting our members.


Dr. Christian Grams
Finance

YIN strives to make KIT an ideal place for young scientists. YIN helps its members thrive in their research pursuits by encouraging collaborative discussions and projects. Interdisciplinary proposal coordination meetings help to bring members of related disciplines together to share their respective expertise and resources. YIN Grants provide a further incentive to pursue these collaborative projects. In addition, YIN has invited leading scientists to speak to YIN members directly and to an open audience as part of the YIN Lecture Series. The network also maintains connections to alumni and contacts with industry to exchange ideas and can discuss research opportunities.


Dr. Dominic Bresser
Public Relations

While our three mission statements have remained relatively unchanged throughout the years, our interpretation has evolved in response to member interests. We sincerely hope that YIN will continue to help our members grow, prove their independence and receive recognition in their respective fields. We also want KIT to remain an attractive place for young investigators. These goals require the active participation of our members and the support of the KIT community. To that end, this newsletter has been prepared to provide you with an update on our members and activities.

YOUNG
INVESTIGATOR
NETWORK

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