

Outstanding!

Junior scientists
of the Max Planck Society
2023



Imprint

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Outstanding!

Dear Members and Friends of the MPG Community,

Every year, when I hold our ›Outstanding!‹ brochure in my hands, I find myself looking into a little treasure chest - filled to the brim with the ideas and plans of some of our most creative junior scientists. It fills me with pride every time to meet these talented young researchers in person at our Annual Meeting. Our Senators feel very much the same way – often I see them reaching for the brochure already during the break, before it's time for a joint lunch together with the awardees.

The Max Planck Directors, for their part, consider the short award ceremonies held during the Section meetings to be genuine highlights. In brief: Everybody wants to see and experience the young talents. The reason is obvious: We are truly impressed and inspired by them, and we all are aware that they have accomplished an enormous amount in an astoundingly short period of time.

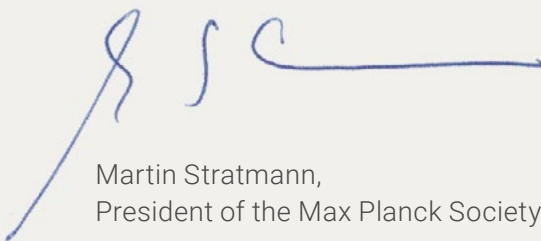
For all our readers, I hope you enjoy getting to know the ›outstanding‹ talents on these next pages, and, once again, I wholeheartedly congratulate each of the award winners on their success! Best of all: Not only can they be proud of what they have achieved already, but above all they can look forward to the time that lies ahead of them. While the doctorate and perhaps



even the early postdoc phase is still to some degree a time of ›guided freedom‹, what follows now is the truly independent unfolding of their individual profiles. Great levels of freedom are waiting out there and many doors are standing wide open.

I wish everyone of you the choice of an exciting environment for your research that allows for interdisciplinarity and in which you can unleash your ideas and at the same time remain open to new impulses! As the Scottish biologist D'Arcy Wentworth Thompson noted in 1903: *›If you dream [...] of future discoveries and inventions, let me tell you that the fertile field of discovery lies for the most part on those borderlands where one science meets another‹*. From my point of view, little has changed in this respect. Always stay curious!

Cordially yours,

A handwritten signature in blue ink, consisting of a stylized 'M' followed by 'S' and a long horizontal line.

Martin Stratmann,
President of the Max Planck Society

Award winners of the past year
at the Annual Meeting of the
Max Planck Society in Berlin







The Otto Hahn Medal

The Max Planck Society has honoured up to 30 young scientists and researchers each year with the Otto Hahn Medal for outstanding scientific achievements since 1978. The prize is intended to motivate especially gifted junior scientists and researchers to pursue a future university or research career.

Usually, the award is presented during the General Meeting in the following year.



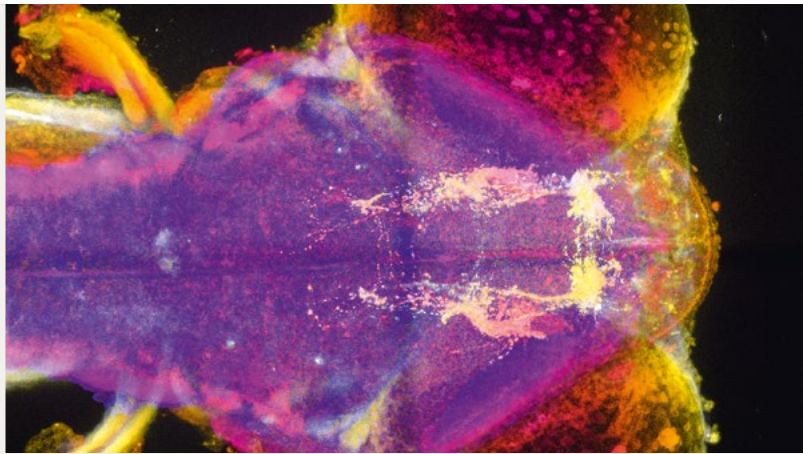
Dr. rer. nat. Lukas Anneser

for the discovery that the neuropeptide Pth2 quantitatively tracks the presence of conspecifics via mechanosensation in zebrafish

Max Planck Institute for Brain Research,
Frankfurt am Main

Research field: Neuroscience

Current activity: Postdoctoral Researcher at the
Friedrich Miescher Institute for Biomedical Research,
Basel, Switzerland



My topic of interest

The social environment shapes the organization of the brain. What kind of molecular adaptations and genetic factors exist which could explain the consequences of social isolation? My work identified a specific peptide encoding the presence of conspecifics precisely and quantitatively.

My motivation

In an ever-changing world, animals must be capable of focusing on relevant factors. It is a fascinatingly complex question how the brain is parsing information in a situation-specific manner, which may also reveal a lot about ourselves. The possibility to visualize and thus reveal the underlying processes in biology is a deeply aesthetic and motivational experience for me.

My next professional station

I am currently working as a Postdoc at the Friedrich Miescher Institute for Biomedical Research in Basel and I try to understand how different neuromodulatory systems may synergistically interact.

Dr. rer. nat. Dmitriy Borodin

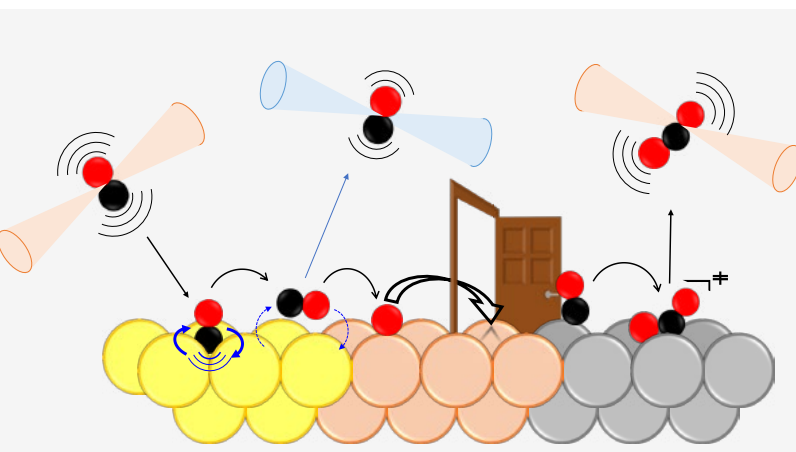
for the development of experimental methods for the high-precision measurement of the thermal rate constants of elementary reactions on catalytic surfaces

Max Planck Institute for Multidisciplinary Sciences,
Göttingen

Research field: Kinetics and Dynamics at Surfaces

Current activity: Postdoctoral Researcher at the
Center for Quantum Nanoscience in Seoul, South Korea

Additional Award: Otto Hahn Award, see page 38



My topic of interest

Our research aimed to provide insights into how chemistry at surfaces takes place. Our central objective was to understand processes at the elementary level, essentially providing an atomic level picture.

My motivation

The field of heterogeneous catalysis is very broad and of high interest to industrial chemistry. Unfortunately, there are many open questions like how do molecules adsorb and exchange energy with the surface or which quantum effects are responsible for the formation of chemical bonds at metal surfaces. For me it is beautiful to understand the nature of chemical reactions at surfaces.

My next professional station

Motivated by some of the findings from my doctoral research I went for a postdoc to the Center for Quantum Nanoscience in Seoul. Here I work with Andreas J. Heinrich on novel experimental methods for the investigation of spin dynamics in atoms and molecules on surfaces. I am interested to learn new experimental methods which may help us understand the importance of electron spins in heterogeneous catalysis.

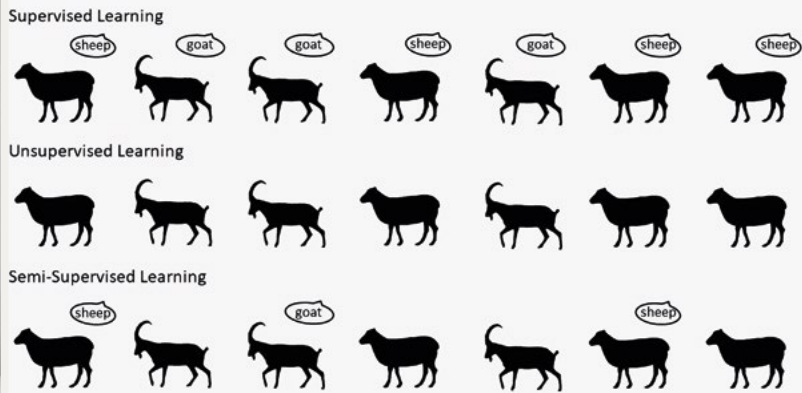
Franziska Bröker PhD

for research on the role of feedback
in human learning

Max Planck Institute for Biological Cybernetics,
Tübingen

Research field: Computational Neuroscience

Current activity: Postdoctoral Researcher at
Carnegie Mellon University, Pittsburgh, USA



My topic of interest

I want to understand how humans learn both with and without explicit instruction. Accordingly, I would like to explain how prior experience and feedback shape learning, and how we can model this using artificial intelligence methods.

My motivation

I find the human brain's capacity for learning fascinating. Understanding how brains learn goes to the heart of who we are as humans. Besides the philosophical aspects, the current surge of interest in artificial intelligence means that comparing biological and artificial learning is of very real importance.

My next
professional station

I am a postdoctoral researcher at the Neuroscience Institute at Carnegie Mellon University in Pittsburgh.

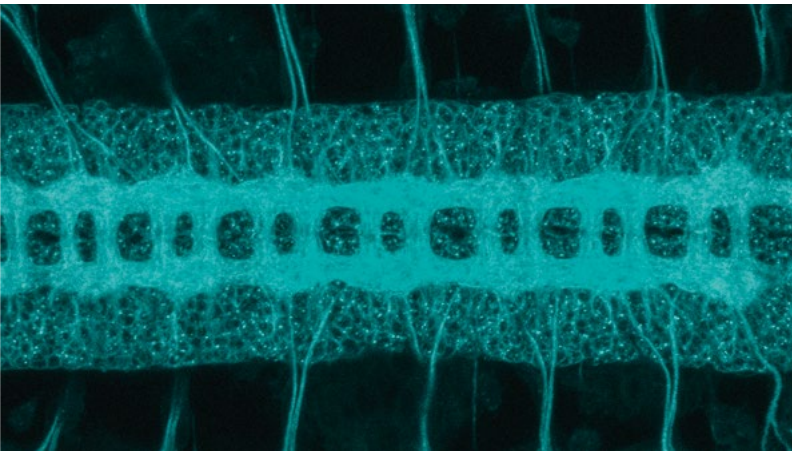
Dr. rer. nat. Judit Carrasco

for the discovery of a genetic program
required for the development
and the proper function of the brain

Max Planck Institute of Immunobiology
and Epigenetics, Freiburg im Breisgau

Research field: RNA Biology

Current activity: Student of Bioinformatics
and Biostatistics at Open University of Catalonia,
Barcelona, Spain



My topic of interest

Alternative RNA isoforms are crucial for cell identity and function, and their expression is regulated by a combination of trans factors that is unique to each cell type. I investigate mechanisms of neuron-specific RNA processing and their impact in neurodevelopment and disease.

My motivation

Since the beginning of my career, I have been awed by the intricate molecular mechanisms that govern the cell and the profound effects even the slightest alterations to these processes can have on an organism. I am thrilled to see my research contributing to the advancement of our understanding of neuronal function, at both the molecular and physiological levels.

My next
professional station

I am currently enhancing my skillset by pursuing a one-year degree in computational biology while simultaneously exploring multiple options to continue my research in the field of RNA biology.

Dr. rer. nat. Constanze Depp

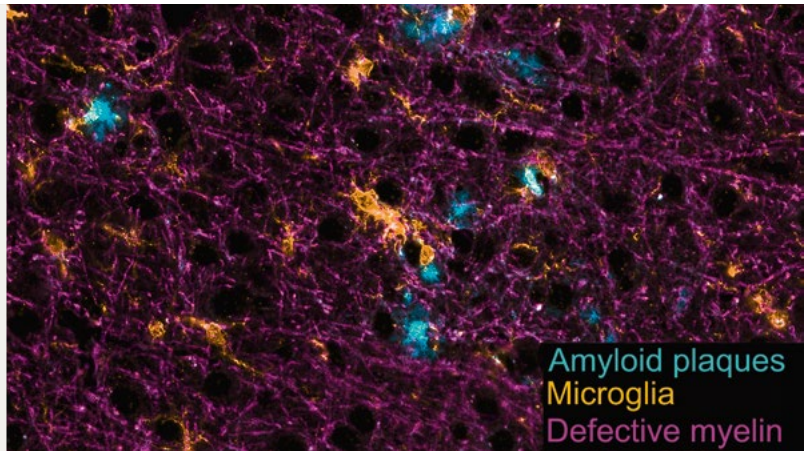
for the discovery of age-related myelin defects as trigger of amyloid deposition in Alzheimer’s disease.

Max Planck Institute for Multidisciplinary Sciences,
Göttingen

Research field: Molecular Neurosciences

Current activity: Postdoctoral Researcher at Boston Children’s Hospital/Harvard Medical School and Broad Institute of MIT and Harvard, Massachusetts, USA

Additional Award: Peter Hans Hofschneider Prize,
see page 46



My topic of interest

I would like to understand why the ageing brain becomes susceptible to neurodegenerative diseases and how we could prevent this.

My motivation

I was always deeply fascinated by how the brain works. Today, I am driven by my desire to understand the molecular mechanisms underlying brain diseases, especially dementia. I firmly believe that only this detailed understanding will lead to effective therapies for neurodegenerative diseases.

My next professional station

I recently joined Beth Stevens’ Lab at Boston Children’s Hospital/Harvard Medical School as a Postdoctoral Research Fellow and will continue exploring the mechanisms causing Alzheimer dementia – with a focus on the brain’s immune cells.

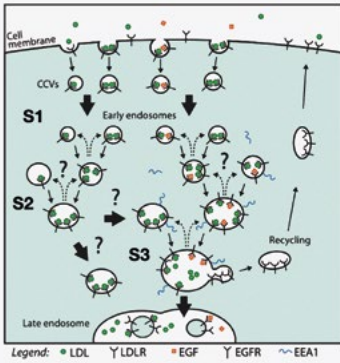
Lorenzo Duso PhD

for his work on stochastic modeling of compartmentalized biochemical systems

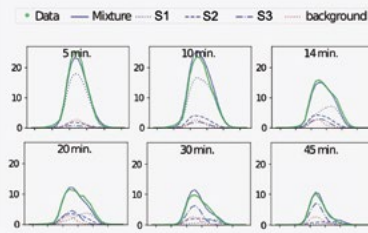
Max Planck Institute of Molecular Cell Biology and Genetics, Dresden

Research field: Mathematical Biology

Current activity: Senior Associate Climate Risk Management at PwC Germany, Berlin



$$p(\Theta|\mathcal{Y}, m) = \frac{L(\Theta; \mathcal{Y}, m)p(\Theta|m)}{p(\mathcal{Y}|m)}$$



My topic of interest

The main question of my PhD was to understand how biochemical systems can function reliably despite the noisy dynamics of molecules and cellular structures.

My motivation

I am generally interested in developing quantitative methods to analyze physical systems that display a noisy behaviour. During my PhD I developed methods to unveil the functioning of biomolecular networks, and now I apply similar concepts to study financial risks and natural hazards.

My next professional station

I work as Senior Associate in climate risk management at PwC Germany. In this role, I advise German financial institutions on the quantification of risks related to sustainability issues and climate-related natural hazards.

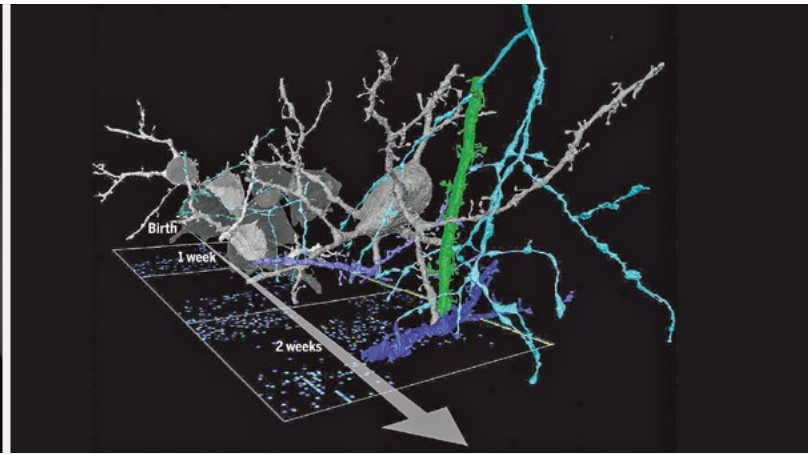
Dr. rer. nat. Anjali Gour

for the connectomic analysis of inhibitory circuit development in the mouse cortex after birth

Max Planck Institute for Brain Research,
Frankfurt am Main

Research field: Neuroscience

Current activity: Consultant at Bayer AG
Strategy & Business Consulting, Leverkusen



My topic of interest

Neurons in our brains form complex networks via connections or synapses. I wanted to understand how these networks were formed during early postnatal development and if there were any rules for building the trillions of synapses in these networks. My work provided novel insights into the role of synapse removal for formation of inhibitory circuits and showed the target preference for Chandelier neurons (class of interneurons) was formed much earlier than previously known.

My motivation

I have always been fascinated by the complexity of the neuronal networks in brains and wanted to understand how these circuits were formed. The possibility of finding some guiding rules or principles that determine which connections or synapses are to be established or removed or maintained kept me motivated. I strongly believe that understanding the overall principles and mechanisms underlying neuronal circuit formation will provide new perspectives also in understanding psychiatric disorders.

My next professional station

I am working as a Consultant at Bayer Strategy & Business Consulting in Research & Development. I am using the knowledge and skills I learnt during my PhD to tackle the complex challenges in the life science industry.

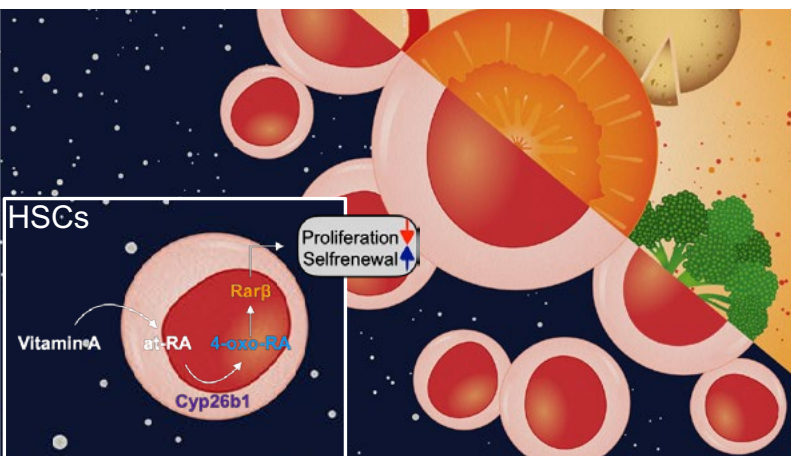
Dr. rer. nat. Katharina Miriam Schönberger

for the discovery of a new mechanism on how dietary vitamin A regulates hematopoietic stem cells

Max Planck Institut of Immunobiology and Epigenetics, Freiburg im Breisgau

Research field: Cellular Biochemistry

Current activity: Novartis Institutes for BioMedical Research, Basel, Switzerland



My topic of interest

Hematopoietic stem cells hold the unique capacity to restore the entire blood system. My research focuses on understanding the key mechanisms of how diet-derived metabolites, such as vitamin A, contribute to these unique stemness capacities, and ultimately, prevent the development of leukemia.

My motivation

I find it incredibly fascinating how life style, including our dietary choices, cannot only influence the function of individual cells in our bodies, but may ultimately impact the development and outcome of many diseases. I believe that unravelling the underlying molecular mechanisms will help us in the future to improve our strategies for disease prevention and therapies. Thus, finding the answers to some of those questions is not only highly rewarding itself, but often stimulates great team work with enthusiastic and engaged scientists.

My next professional station

In my current position as a postdoctoral researcher at the Novartis Institutes for BioMedical Research in Basel, I try to understand the interplay between metabolism and epigenetics to control hepatocyte identities and how these mechanisms contribute to liver regeneration.

Dr. rer. nat. Zhexin Wang

for the study of the structural organization
of muscles using cryo-electron tomography

Max Planck Institute of Molecular Physiology,
Dortmund

Research field: Structure Biology

Current activity: Postdoctoral researcher at the
MRC Laboratory of Molecular Biology, UK

Additional Award: Otto Hahn Award, see page 38



My topic of interest

Sarcomeres are force-generating and load-bearing devices of muscle. My PhD research aimed to understand the three-dimensional organization of a sarcomere at molecular level and reveal how the sarcomeric components interact with each other for efficient muscle contraction.

My motivation

Muscle is essential for human activity. A three-dimensional molecular landscape of muscle is the key to understand the process of contraction by the coordination of all components. With cryo-focused ion beam milling and electron cryo-tomography, I was able to directly see individual molecules inside muscles. This is both visually fascinating and rewarding as the new insights from my research will facilitate future development of strategies against muscle diseases and muscle ageing.

My next professional station

I currently proceed with my research career as a postdoc at MRC Laboratory of Molecular Biology in Cambridge, UK,

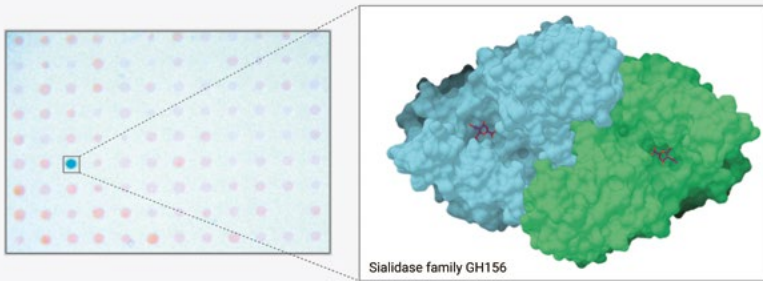
Dr. rer. nat. Léa Chuzel

for investigations on functional metagenomics
for discovery of new enzymes that act upon
glycans to answer fundamental and application-
driven questions in the field of glycobiology

Max Planck Institute for Dynamics of Complex
Technical Systems, Magdeburg

Research field: Glycobiology

Current activity: Research scientist at
New England Biolabs, Ipswich, Massachusetts, USA



My topic of interest

Glycans are structurally complex sugar-polymers that play many essential roles in cell biology, regulate the function of biologic drugs, and serve as biomarkers of many diseases. The range of enzyme specificities that act upon glycans in nature is vast and incompletely defined. My research established methods and environmental DNA resources for high-throughput enzyme discovery of new specificities that address both fundamental and application-driven questions in glycobiology.

My motivation

Some estimates suggest there are over 1 trillion species of bacteria on earth, with less than 0.1% having been characterized to date. I am highly motivated to explore this vast untapped genetic diversity to discover new protein families or new enzymatic activities, especially for enzymes that act on carbohydrates. New enzyme discoveries advance science, enable new applications, and are intellectually very rewarding.

My next
professional station

I currently run a core facility dedicated to environmental enzyme discovery at New England Biolabs in Ipswich, USA.

Chemistry,
Physics &
Technology
Section

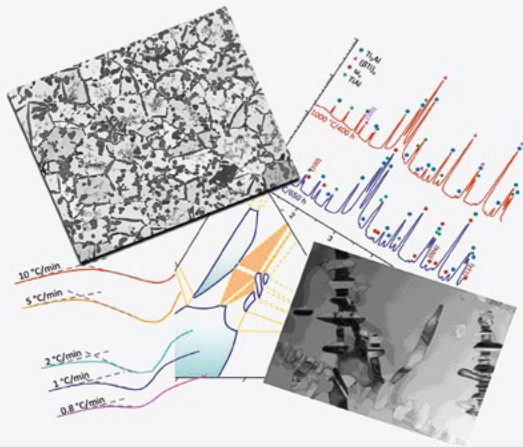
Dr.-Ing. Benedikt Distl

for research on complex phase equilibria and transformations, knowledge of which enables the development of energy-saving and greenhouse gas-reducing Ti-Al based materials

Max-Planck-Institut für Eisenforschung GmbH,
Düsseldorf

Research field: Materials Science

Current activity: Development Engineer for Additive Manufacturing of Refractory Metals at Plansee SE, Reutte, Austria



My topic of interest

In order to meet future environmental requirements, aircraft turbines must become more effective. This requires the improvement of the high-temperature properties of TiAl-based alloys, which is only possible with the exact knowledge of the phase equilibria of different Ti-Al-X alloy systems. Elements such as niobium, molybdenum and tungsten play a decisive role here due to their β -stabilizing properties.

My motivation

The improvement and development of materials, through the combination of different metals, fascinates me. Only by combining the unique properties of each metal a completely new material with a unique property profile can be created. This pushes the boundaries of what is possible and enables novel, innovative applications. These applications contribute to making a better future possible and finding answers to the questions of tomorrow.

My next professional station

I currently work at Plansee SE and am involved in additive manufacturing of tungsten and molybdenum to lay the foundation for new products made from refractory metals.

Chemistry,
Physics &
Technology
Section

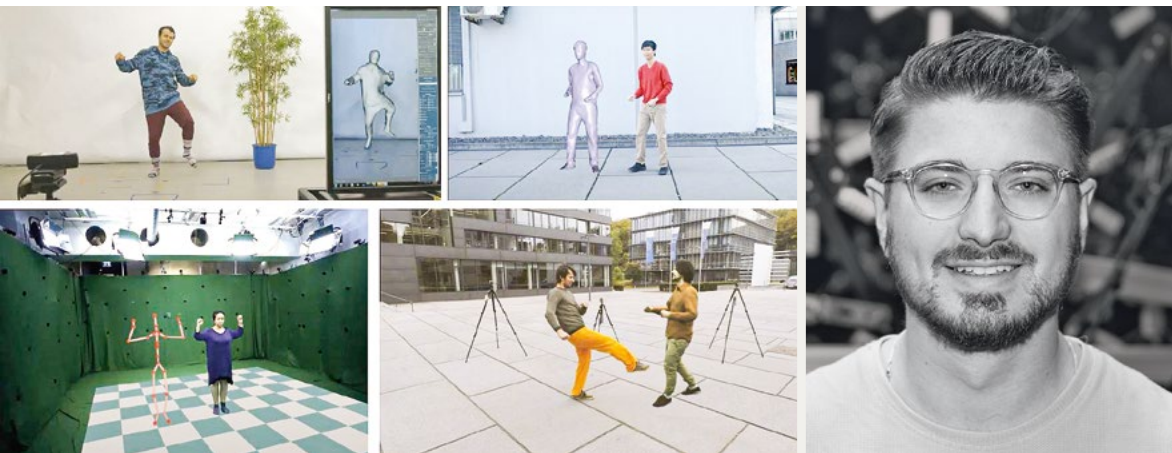
Dr.-Ing. Marc Habermann

for the development of novel GPU-parallelized optimization and deep learning algorithms for space-time coherent human performance capture and synthesis at real-time frame rates

Max Planck Institute for Informatics, Saarbrücken

Research field: Computer Graphics, Computer Vision, Machine Learning

Current activity: Research Group Leader/Head of the Real Virtual Lab at Max Planck Institute for Informatics



My topic of interest

Can computers learn a deeper understanding of humans from raw sensing data? Can we build photorealistic and drivable avatars of real humans solely from sensor measurements?

My motivation

The main element in many image compositions is the human, i.e., most of the images one finds in the media, such as on the Internet or in textbooks and magazines, contain humans as the main point of attention. A remaining challenge till today is how digital systems can efficiently and accurately interpret those measurements of humans. In my research, I develop algorithms for capturing the 3D human geometry from potentially sparse camera views. Moreover, in-person communication and interaction are not always possible. Therefore, my research also aims at building photorealistic digital twins, such that immersive communication can happen across the globe while people are physically far away from each other.

My next professional station

In 2021, I started a position as a Research Group Leader at the Max Planck Institute for Informatics. In parallel, I am also the head of the Real Virtual Lab, which is a laboratory hosting state-of-the-art multi-camera systems.

Chemistry,
Physics &
Technology
Section

Dr. rer. nat. Joannis Koepsell

for the discovery and application of spin- and density-resolved single-atom detection methods of ultracold atoms in optical lattices

Max Planck Institute of Quantum Optics, Garching

Research field: Quantum Simulation, Ultracold Atoms, Strongly-Correlated Electrons

Current activity: Project Manager Research & Development at ZEISS Semiconductor Manufacturing Technology GmbH, Roßdorf



My topic of interest

Strongly-correlated electronic materials can exhibit exotic phenomena, such as high-temperature superconductivity. In my thesis, I was able to investigate such strongly-interacting systems using tens of thousands of microscopy images from our high-resolution (spin and charge of all particles) quantum simulator. We succeeded in directly imaging magnetic polarons (see picture for artistic representation) by measuring correlations between spins and charges.

My motivation

Exploring the microscopic mechanisms lying at the heart of complex phenomena has fascinated me since my childhood. I enjoy directly looking inside a system and understanding how a puzzling macroscopic phenomenon emerges from the simplest microscopic ingredients.

My next professional station

I joined the R&D department of ZEISS SMT GmbH after my PhD. As a project manager, I am leading the development of photomask repair solutions, which are required for the manufacturing of high-end computer and smartphone chips.

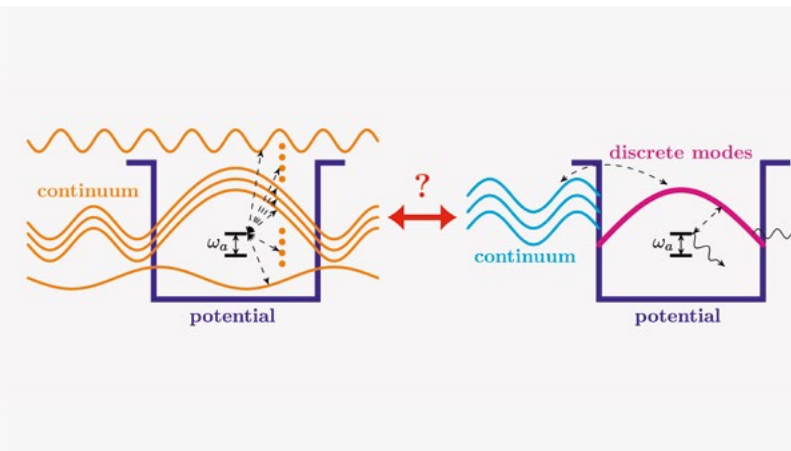
Dr. rer. nat. Dominik Lentrodt

for contributions to the theory of light-matter interactions in open cavities, with applications in nuclear quantum optics

Max Planck Institute for Nuclear Physics, Heidelberg

Research field: Quantum Optics

Current activity: Postdoctoral Fellow at the Albert Ludwig University of Freiburg im Breisgau



My topic of interest

I would like to find out if Mössbauer nuclei can provide fundamental insights into quantum physics. Due to their special properties they may provide new possibilities which are yet unexplored.

My motivation

While the goal of my research is rather practically motivated, I am particularly fascinated by the theoretical problems one encounters on the path towards new insights. During my doctoral thesis, for example, I stumbled over a problem from the theory of open quantum resonators which was yet unsolved. I find strategies to overcome such hurdles in fundamental research exciting.

My next professional station

Currently, I am a Georg H. Endress postdoctoral fellow at the University of Freiburg, where I am investigating the feasibility of creating quantum mechanically correlated Mössbauer photons.

Chemistry,
Physics &
Technology
Section

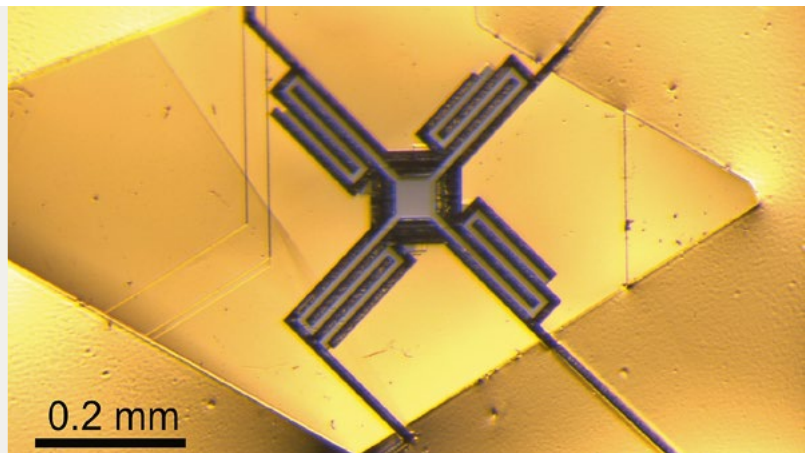
Dr. Philippa Helen McGuinness

for investigations on microstructures
of high-purity delafossite metals by means
of irradiation and electrical transport

Max Planck Institute for Chemical Physics of Solids,
Dresden

Research field: Physics of Quantum Materials

Current activity: Postdoctoral Researcher at the
Karlsruhe Institute of Technology



My topic of interest

I study quantum materials: materials where the effects of quantum mechanics lead to a wide variety of different phenomena. During my doctorate, I investigated a highly electrically conductive class of material to determine not only the origins of the extraordinary conductivity but also the effects this property has on the flow of electricity in structures at the scale of a hundredth of a millimetre.

My motivation

I am fascinated by the rich assortment of behaviour which occurs in quantum materials. The delicate balance of interactions of the particles within leads to a wide range of phenomena, such as magnetism or superconductivity and, with a novel material, there are often many surprises. I find the challenge of discovering and understanding this behaviour in the laboratory, which often involves extremes such as low temperatures or nanostructuring, truly rewarding.

My next
professional station

I am now a postdoctoral researcher in the group of Prof. Dr. Matthieu Le Tacon at IQMT within the Karlsruhe Institute of Technology where I use a different technique, inelastic photon scattering, to continue to study quantum materials.

Dr. rer. nat. Susanne Reischauer

for studies on the use of organic and inorganic semiconducting materials as versatile photocatalysts for organic synthesis

Max Planck Institute of Colloids and Interfaces, Potsdam

Research field: Organic Chemistry and Material Chemistry

Current activity: Postdoctoral Fellow at Northwestern University, Chicago, USA



My topic of interest

Visible-light photocatalysis has become a powerful and sustainable strategy for organic chemistry in the last years. In my doctoral thesis I have developed novel approaches for sustainable, robust photocatalytic transformations, using recyclable organic and inorganic semiconducting materials.

My motivation

Nature is the main inspiration for scientists when it comes to sustainability. In biology, plants use photosynthesis to convert raw materials into chemical energy, exploiting the energy of light. As a chemist, I am passionate to discover and develop new photocatalysts targeting longstanding challenges in medicinal chemistry and drug discovery using renewable feedstock materials.

My next professional station

I am currently working as a postdoctoral research fellow at Northwestern University in Chicago with Prof. Omar Farha and Prof. Justin Notestein. Here, I am combining my expertise in organic and material chemistry working on catalysts for energy applications.

Chemistry,
Physics &
Technology
Section

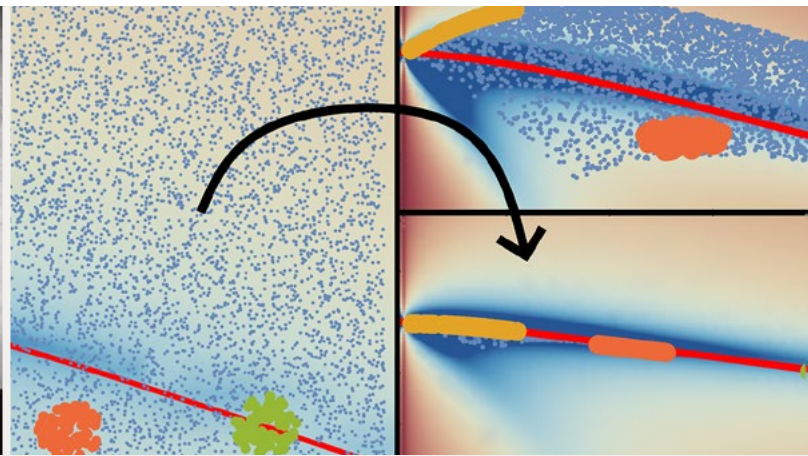
Viktor Svensson PhD

for investigations of novel far from
equilibrium phenomena at high energies

Max Planck Institute for Gravitational Physics
(Albert Einstein Institute), Potsdam

Research field: Fluid Dynamics

Current activity: Postdoctoral Researcher at
the Lund University, Sweden



My topic of interest

When can a system be described as fluid? This question is of importance in e.g. heavy-ion collisions, where a Quark-gluon plasma forms that behaves as a relativistic fluid. In my research, I've focused on understanding how the system loses track of microscopic details and a simpler fluid description emerges.

My motivation

I find it really fulfilling to solve problems and come up with new ways to understand things. There's a great sense of accomplishment when you finally figure something out and share it with others. Science is where that drive to discover and share knowledge can benefit everyone.

My next
professional station

I am postdoc at Lund University, currently working in condensed matter.

Dr. rer. nat. Qun Yang

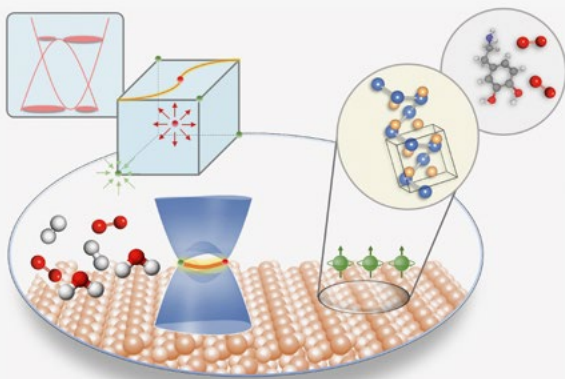
for the prediction of new efficient topological catalysts for water splitting and the understanding of homochiral absorption of molecules on surfaces of topological materials based on the concept of the Berry phase

Max Planck Institute for Chemical Physics of Solids,
Dresden

Research field: Theoretical Catalysis

Current activity: Postdoctoral Researcher at
Weizmann Institute of Science, Rehovot, Israel

Additional Award: Otto Hahn Award, see page 39



My topic of interest

How does topological band structure affect catalytic efficiency? My aim is to design the catalyst for electrochemical hydrogen evolution from the viewpoint of topological band structure and establish the connection between the intrinsic band structure of the bulk crystal and chemical reactivity via the development of catalytic descriptors from the combination of the Hamiltonian model and density functional theory.

My motivation

As a theory scientist, I can obtain great pleasure when my theoretical prediction helps me gain insight into a phenomenon and solve a question that had not yet been answered before. In my research field, my interest is to discover exotic properties in topological materials for energy-related catalysis and utilize them. I feel excited to explore the effect of electronic structures on surface chemical reactions.

My next
professional station

I am currently doing research on exploring exotic transport phenomena induced by topology and chirality at the Weizmann Institute of Science.

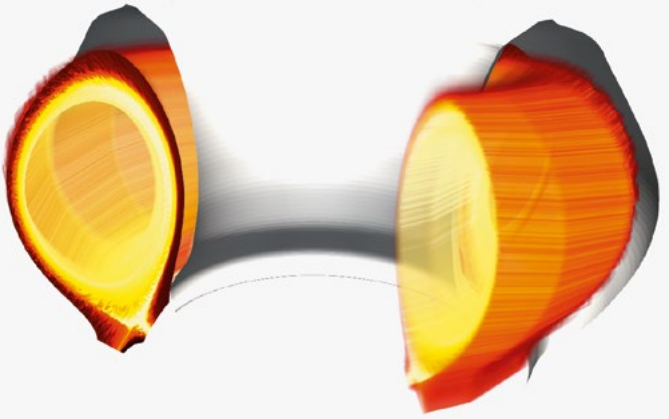
Dr. rer. nat. Wladimir Zholobenko

for groundbreaking investigations of validated simulations of edge turbulence in tokamaks

Max Planck Institute for Plasma Physics, Garching

Research field: Computational Plasma Physics

Current activity: Postdoctoral Fellow at the Max Planck Institute for Plasma Physics



My topic of interest

Magnetic confinement nuclear fusion is a promising solution for the sustainable production of energy and against climate change. However, the hot plasma tends to develop turbulent vortices, which allow it to escape the magnetic confinement. My simulations on high-performance computers allow to further improve the control of this process, particularly under consideration of the plasma-wall interaction, to make fusion reactors economically viable.

My motivation

I believe that I work on a problem which is particularly important for humankind. Additionally, turbulent flows in magnetized plasmas are absolutely fascinating. Chaotic multi-scale systems frequently arise in nature, including in human society; thus I believe that I learn a lot about the world as a whole. I also like to work on the underlying tough mathematical problem, namely the numerical solution of nonlinear partial differential equations, like the Navier-Stokes-Maxwell system.

My next professional station

As a postdoc in the framework of a EUROfusion Researcher Grant, I will be simulating the promising scenarios over the next two years that have been thus far developed on our in-house experiment ASDEX Upgrade, with the goal to virtually extrapolate to larger fusion power plants.

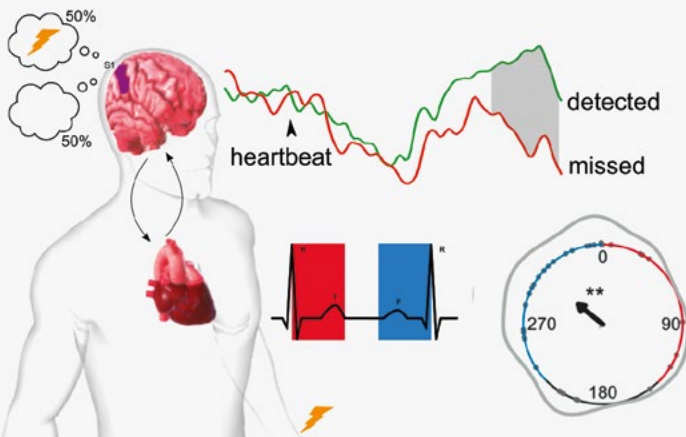
Esra Al PhD

for demonstrating two mechanisms of how internal body signals can influence conscious perception of the external world

Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig

Research field: Cognitive Neuroscience

Current activity: Postdoctoral Researcher at the Columbia University, New York, USA



My topic of interest

How do we consciously perceive our environment? How does the dynamic interaction between body and brain shape human perception? Could heartbeats influence perception of touch?

My motivation

I am fascinated by how our perception of the world changes from moment to moment, even when we are exposed to the same stimuli. While most neuroscience research has focused on the brain, recent studies have revealed that our body, including our heartbeats, also play a role in shaping perception. I am motivated to understand how the dynamic interplay between the body and brain contributes to our conscious experience.

My next professional station

I am currently a postdoctoral researcher at Columbia University, where I am continuing my investigations into how respiratory and cardiac signals shape perception using intracranial neural recordings. Furthermore, I research how body-brain coupling is related to changes in anxiety levels and whether it is mediated by arousal.

Dr. Micha Heilbron

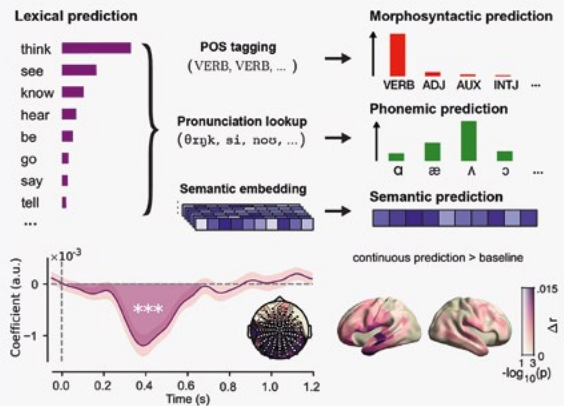
for his research on the role of prediction in processing human language, both spoken and written

Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands

Research field: Cognitive Neuroscience, Psycholinguistics, Cognitive Science

Current activity: Assistant Professor of Cognitive AI at the University of Amsterdam, The Netherlands

Additional Award: Otto Hahn Award, see page 39



My topic of interest

In the cognitive sciences, the brain is increasingly understood as a 'prediction machine' that makes sense of the world by comparing incoming signals to internal predictions. In my work, I characterized the computational nature of such predictive operations in language comprehension.

My motivation

Advances in AI are allowing for new ways to formalize and quantify information processing in the brain. Moreover, technologies like ChatGPT demonstrate the stunning forms of intelligent behaviour that emerge from simple, predictive principles. I believe that we are living in one of the most exciting scientific periods in history, both for those studying natural minds and those trying to build artificial ones.

My next professional station

I am starting as an Assistant Professor of Cognitive AI at the University of Amsterdam. I will be using AI to advance cognitive science, and using tools and ideas from cognitive science to study AI.

Dr. jur. Dominik Krell

for his work on the role of Islamic law
in the legal system of Saudi Arabia

Max Planck Institute for Comparative and International
Private Law, Hamburg

Research field: Comparative Law and Islamic Studies

Current activity: Leverhulme Early Career Fellow at
the University of Oxford, UK



My topic of interest

In my research, I explore how Islamic law is understood and applied in Saudi Arabia today. I address two main questions: First, what is the prevailing understanding of an Islamic judiciary among Saudi jurists? And second, how is this reflected in the Saudi legal system, its laws, its institutions, and the courts' practice?

My motivation

My main motivation is to better understand the role religious law can play in legal systems today. Saudi Arabia is a great example as it is the only major legal system today in which the legal system is dominated by religious scholars.

My next
professional station

I am currently a Leverhulme Early Career Fellow at the University of Oxford. For the next three years, I will be studying the influence of Saudi Arabia on the legal systems of other Muslim countries, particularly in Africa and Southeast Asia.

Dr. phil. Anselm Küsters

for research on the influence of ordoliberalism
on European Competition Law

Max Planck Institute for Legal History and
Legal Theory, Frankfurt am Main

Research field: Economic and Legal History,
Digital Humanities

Current activity: Head of Department at the
Centre for European Policy (cep), Berlin



My topic of interest

To date, the real-world influence of different schools of economic thought on European competition law has been controversial. My study aims to fill this research gap by proposing and applying a new perspective and a digital methodology to empirically capture the conceptual influence of these schools for the first time.

My motivation

Since childhood, the power of the written word has fascinated me; so early on I aimed to address the extent of competing language games and the potential for conceptual confusion in my research on European history. I am convinced that a successful progression of European integration – in whatever guise – requires a better recognition of these semantic and conceptual differences in Europe, because only then can they be democratically mediated. A common understanding of language can unite societies, and digital methods allow this potential to be better exploited in the future.

My next
professional station

Since October 2022, I have been working on digital policy as Head of Department at the Centre for European Policy (cep) in Berlin. In parallel, I am pursuing my research in economic and legal history as a post-doctoral researcher at the Humboldt University of Berlin and as an associate researcher at the Max Planck Institute for Legal History and Legal Theory in Frankfurt am Main.

Dr. jur. Anna Pinget

for studies in comparative law on the criminalization of direct and indirect motivation to commit criminal offences in German and French law

Max Planck Institute for the Study of Crime, Security and Law, Freiburg im Breisgau

Research field: Criminal Law, Comparative Law

Current activity: Postdoctoral Researcher at the University of Giessen and Max Planck Institute for the Study of Crime, Security and Law



My topic of interest

Which utterances are punished under criminal law in France and in Germany on the grounds that they may motivate third parties to commit crimes? What are the limits of such punishment in terms of criminal law theory and constitutional law?

My motivation

With the development of new risks and new complex forms of crime, there is a growing demand for the preventive use of criminal law, which usually only intervenes after the commission of an offence. Of particular interest to me is the preventive shift of criminal law through the criminalization of preparatory and endangering offences as well as through offences for the protection of supra-individual legal goods. The observation and analysis of this development in different legal systems and the question of the limits of criminal law drive me in my research.

My next professional station

I am currently pursuing my comparative law research in the project ›Seeing Antisemitism Through Law‹ based at the University of Giessen. I also hold a researcher position in the Department of Public Law at the Max Planck Institute for the Study of Crime, Security and Law.

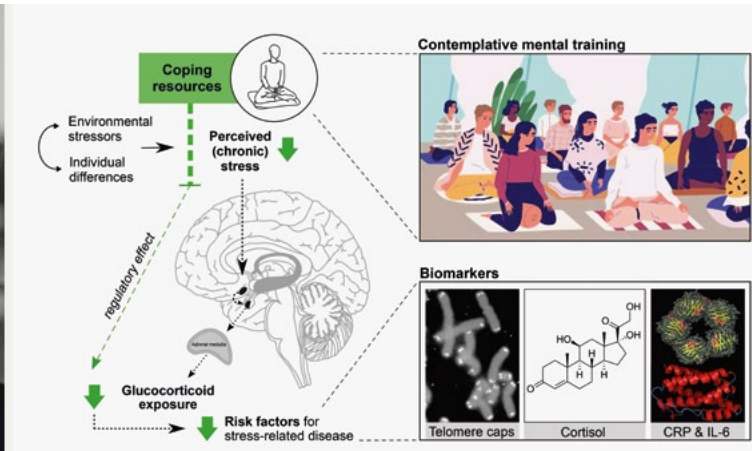
Dr. rer. nat. Lara Puhmann

for her outstanding work on how mindfulness-based mental training can reduce stress and improve the health status of adults

Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig

Research field: Biological Psychology

Current activity: Postdoctoral Researcher at the Leibniz Institute for Resilience Research, Mainz



My topic of interest

In our modern everyday life, we are constantly confronted with psychosocial stressors, which leads to an over-activation of the psycho-physiological stress system and contributes to the development of diseases. With my work, I examine whether the training of cognitive and affective mental resources can strengthen our stress regulation to preventively counteract physical risk-factors for diseases.

My motivation

Biopsychology is unique in its capacity to study health as the interaction between biomedical and psychosocial factors. Thus, researching the neurobiology of stress also means investigating the consequences of typical stressors of a modern meritocratic society – from low socio-economic status to lack of empathy and social isolation. I am convinced of the social relevance of this research question and fascinated by the multifaceted nature of the biopsychosocial perspective.

My next professional station

I am currently expanding my research on stress and protective factors as a Postdoctoral Researcher at the Leibniz Institute for Resilience Research.

Dr. jur. Bruno Rodrigues de Lima

for the research on the legal history of Brazil
and the history of the abolition of slavery

Max Planck Institute for Legal History and Legal Theory,
Frankfurt am Main

Research field: Legal History and Legal Theory

Current activity: Postdoctoral Researcher at the
Max Planck Institute for Legal History and Legal Theory



My topic of interest

I sought to understand the normative production of freedom in 19th century Brazilian slave society. For this, I researched hundreds of freedom lawsuits by the jurist Luiz Gama—a black abolitionist who is the first former slave to become a lawyer in the Americas. The actions of Gama before the courts had a profound social impact and helped approximately 500 enslaved people gain freedom, so I attempted to explain how this unprecedented achievement occurred in Atlantic slave societies.

My motivation

I have dedicated myself since I was very young to understanding the history of slavery in my country, Brazil, and its legacies in contemporary society. I soon realized that to innovate my field of research I would need to discover hundreds of legal stories hidden in official history bunkers. Bearing this in mind, I found digging into slavery archives to search for stories of freedom carried out by enslaved people tremendously rewarding. I uncovered more than a thousand of them, and each one I celebrated as an important achievement. In addition, sharing my archival findings with colleagues and the public is really exciting for me.

My next
professional station

I am currently in my second year of postdoctoral research at the Department of Multidisciplinary Theory of Law at the Max Planck Institute for Legal History and Legal Theory.

Dr. jur. Jonathan Schindler

for the doctoral thesis on »Money Laundering Legislation and Tax Law« in national and international comparison with reference to infringements of the rule of law

Max Planck Institute for Tax Law and Public Finance, Munich

Research field: Tax Law and Constitutional Law

Current activity: Trainee at the Higher Regional Court Munich



My topic of interest

I am interested in the protection of fundamental rights in the modern tax state. The progress of digitalization can make tax enforcement more effective, but it also poses risks, especially for the right to privacy.

My motivation

I find it fascinating to look at the genesis of legal norms and their economic, social and societal implications. For me, jurisprudence is only conceivable in an interdisciplinary way.

My next professional station

After the 2nd state exam, I will decide which track I want to take going forward.

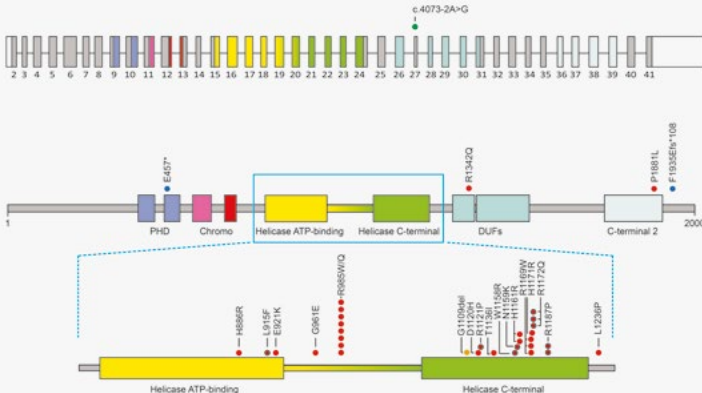
Dr. Lot Snijders Blok

for the discovery and characterization of multiple novel genetic syndromes involving speech and language disruptions, yielding substantial new insights into etiology of this major class of disorders

Max Planck Institute for Psycholinguistics, Nijmegen, the Netherlands

Research field: Human Genetics

Current activity: Clinical Geneticist at the Radboud University Medical Center, Nijmegen, the Netherlands



My topic of interest

With my research I aim to unravel new molecular mechanisms causing rare developmental disorders with speech and language impairments. By better understanding why and how disruptive DNA variants cause developmental delays, we do not only learn more about the biological background and pathways involved, we are also able to improve our genetic testing strategies.

My motivation

My strongest motivation is a curious nature, in combination with a passion for everything related to DNA. I am fascinated by small DNA variants having big impact on human development, and how we can study these using new and continuously improving genetic techniques. As a medical doctor working in clinical genetics, I know how important a genetic diagnosis can be for the families involved. This inspires me to perform research that contributes to better care for individuals with developmental disorders.

My next professional station

I am currently working as a Clinical Geneticist in the Human Genetics Department of the Radboud University Medical Center in Nijmegen, the Netherlands. In addition to working in the clinic, I really like to perform research on the interface of medical genetics and molecular biology, and I hope to be able to start my own research group in the future.

Dr. jur. Luke Dimitrios Spieker

for the study of the foundations, potential and risks of EU values in the jurisprudence of the Court of Justice

Max Planck Institute for Comparative Public Law and International Law, Heidelberg

Research field: EU Law, Constitutional Law

Current activity: Senior Research Fellow at the Max Planck Institute for Comparative Public Law and International Law



My topic of interest

Is compliance with the rule of law, democracy, and human rights – the Union’s founding values enshrined in Article 2 of the EU Treaty – enforceable before the courts? And what is the effect of these values in the legal orders of the EU and its Member States? My research provides foundations, explores potentials, and analyzes the risks of their judicial activation. As such, it seeks to improve the protection of the rule of law, democracy, and human rights throughout the European Union.

My motivation

It fascinates me when my research contributes to overcoming central challenges of society. For that reason, I focus on developing constructive solutions that can become directly applicable in legal practice. In this way, my previous research on EU values should help institutions and affected persons to counter violations of the rule of law, democracy, and human rights more decisively.

My next professional station

I am currently a legal trainee at the Berlin Higher Regional Court. After completing a stage at the European Commission’s Legal Service, I would like to continue my research at the Max Planck Institute for Comparative Public Law and International Law in November 2023.

The Otto Hahn Award

The Otto Hahn Award is bestowed by the Max Planck Society every year to particularly worthy recipients of the Otto Hahn Medal.

The award provides for a long-term research residency abroad, followed by leadership of a research group on the scientist's own research topic at one of the Max Planck Institutes. The award is intended to pave the way for a long-term scientific career in Germany.

Lise Meitner and
Otto Hahn in the laboratory,
Kaiser Wilhelm Institute
for Chemistry, 1913



This year, four scientists
will be honoured with the
OTTO HAHN AWARD
of the Max Planck Society.

Dr. rer. nat
Dmitriy Borodin

Biology & Medicine Section
see page 9



Dr. rer. nat.
Zhexin Wang

Biology & Medicine Section
see page 16



**Dr. rer. nat.
Qun Yang**

Chemistry, Physics & Technology
Section
see page 25




Dr. Micha Heilbron

Human Sciences
Section
see page 28



Hermann Neuhaus
**Hermann
Neuhaus
Prize**



Hermann Neuhaus (1931– 2007) was a successful entrepreneur. Like many excellent scientists, he used his untiring creativity and critical mind to strive constantly for the best. His aim was to sustainably shape the future for generations to come. He is the most generous benefactor of the Max Planck Society and posthumously received the Harnack Medal, its highest accolade.

Since 2018, the Max Planck Foundation and the Hermann Neuhaus Foundation have awarded the Hermann Neuhaus Prize in his memory. The prize recognizes outstanding postdoctoral achievements with reference to applied research, particularly in the Biology & Medicine Section and the Chemistry, Physics & Technology Section.

In accordance with the benefactor's last will, the prize money enables the winners to further advance their research's potential for application.

Dr. rer. nat. Ulrich Lutz

for the development of methods for rapid and inexpensive diagnosis of herbicide resistance in agriculturally relevant weeds

Max Planck Institute for Biology Tübingen

Research field: Molecular Genetics of Plants

Current activity: Postdoctoral Researcher at the Max Planck Institute for Biology Tübingen



My topic of interest

Due to rapidly changing environmental conditions, plants must constantly adapt to their environment to ensure reproductive fitness. I am investigating how they do so by deciphering the complex genetic basis of evolutionary adaptive traits. Further, on a more applied level, I am developing tools for the genetic diagnosis and the management of herbicide-resistant weeds, which are threatening crop yields globally.

My motivation

Global demand for farm products is increasing and agriculture must simultaneously achieve ever higher yields, become more sustainable and cope with the negative effects of climate change. I am particularly motivated to contribute to these global challenges on a molecular genetics level, but also by transferring methods that we developed in the laboratory to the field of agricultural technology to inform farm management decisions.

My next professional station

I continue to advance my academic and applied research at the Max Planck Institute for Biology Tübingen with the long-term goal of contributing to an industrial environment with a strong focus on research and development.

The Dieter Rampacher Prize

As a motivation for students to complete a PhD when young, the Dieter Rampacher Prize has been awarded to the youngest PhD student of the Max Planck Society every year since 1985. The prize usually goes to a young researcher aged 25 to 27. The prize also includes a monetary award.

The prize was endowed by Dr. Hermann Rampacher, a Supporting Member of the Max Planck Society, in memory of his brother, Dieter Rampacher, a physics student at the TH Stuttgart, who died in battle in 1945 at the age of 20.

Carsten A. Rampacher, son of the benefactor and also a Supporting Member of the Max Planck Society, has assumed funding of the prize since 2011.

Herrmann Rampacher
talking with
Chaitanya Giri,
winner of the
Dieter Rampacher
Prize 2015



Dr. jur. Anja Geller

for the dissertation ›Social Scoring by States. Legitimacy under European Law – with References to China‹

Max Planck Institute for Innovation and Competition, Munich

Research field: Data Protection Law, Constitutional Law

Current activity: Trainee Lawyer at the Higher Regional Court of Munich



My topic of interest

Data-based scoring systems are becoming more and more widespread; they touch many areas of life and can take on different forms. State decision-makers are also increasingly making decisions about individuals based on scores. Can there be legitimate state scoring systems or should their use always be rejected?

My motivation

I am interested in current legal problems with social significance. I find it particularly fascinating not only to take a purely legal perspective, but also to include findings from other fields of research.

My next professional station

After my state exam next year, I would like to become a lawyer. Besides that, I would like to stay connected to research and especially contribute to journal articles.

COMMEMORATING
THE DEATH OF
HERMANN HANS
RAMPACHER
(29.12.1934–21.01.2023)

Hermann Hans Rampacher had already been associated with the Max Planck Society through his work at the then Max Planck Institute for Physics and Astrophysics under the directorship of Werner Heisenberg.

He continued to maintain close ties with our research organization as a Supporting Member from 1974 onwards. In 1985, he endowed the Dieter Rampacher Prize, which the Max Planck Society annually awards to promising young scientists at its Annual General Meeting (see pages 42/43).

The Max Planck Society will honour the legacy of Hermann Hans Rampacher.

Peter Hans Hofschneider Prize

The Peter Hans Hofschneider Prize has been awarded by the Max Planck Society every two years since 2005. The award honours groundbreaking research in the area of molecular medicine. This year two young scientist were honoured with the Peter Hans Hofschneider Prize.

Peter Hans Hofschneider, for whom the award is named, is regarded as a pioneer in the field of molecular biology and one of the key figures in interferon research. From 1966 onwards, he was Director at the Max Planck Institute of Biochemistry in Martinsried.



Dr. rer. nat. Constanze Depp

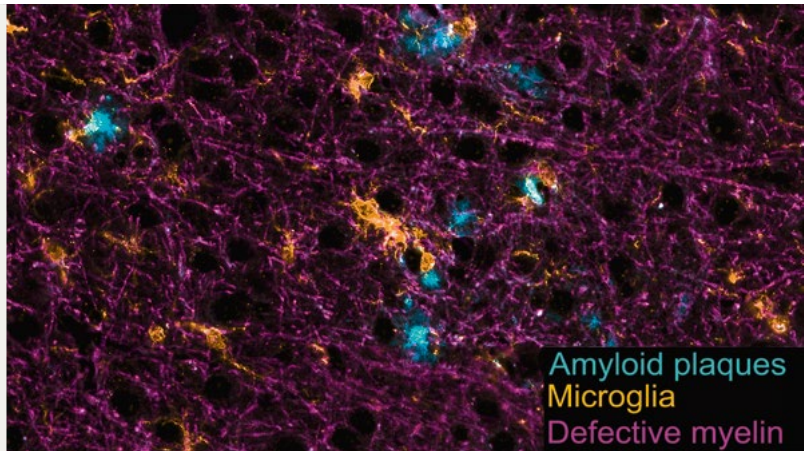
for the discovery of age-related myelin defects as trigger of amyloid deposition in Alzheimer’s disease

Max Planck Institute for Multidisciplinary Sciences, Göttingen

Research field: Molecular Neurosciences

Current activity: Postdoctoral Researcher at Boston Children’s Hospital/Harvard Medical School and Broad Institute of MIT and Harvard, Massachusetts, USA

Additional Award: Otto Hahn Medal, see page 12



My topic of interest

I would like to understand why the ageing brain becomes susceptible to neurodegenerative diseases and how we could prevent this.

My motivation

I was always deeply fascinated by how the brain works. Today, I am driven by my desire to understand the molecular mechanisms underlying brain diseases, especially dementia. I firmly believe that only this detailed understanding will lead to effective therapies for neurodegenerative diseases.

My next professional station

I recently joined Beth Stevens’ Lab at Boston Children’s Hospital/Harvard Medical School as a Postdoctoral Research Fellow and will continue exploring the mechanisms causing Alzheimer dementia – with a focus on the brain’s immune cells.

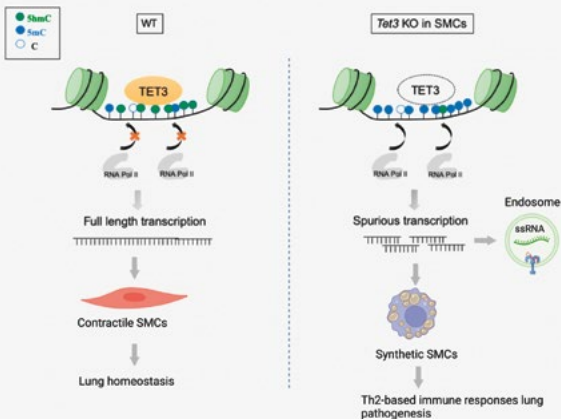
Dr. rer. nat. Fan Wu

for her scientific contribution to the elucidation of a potential link between the pathogenesis of asthma bronchiale and epigenetic changes

Max Planck Institute for Heart and Lung Research, Bad Nauheim

Research field: Epigenetics

Current activity: Postdoctoral Researcher at Max Planck Institute for Heart and Lung Research



My topic of interest

Bronchial asthma is the result of chronic inflammation of the airways. I would like to identify a fundamental mechanism in the mouse model that perpetuates inflammatory reactions in asthma.

My motivation

In sample material from asthma patients, I found a dramatic reduced proportion of a modified base (5-hydroxymethylcytosine, abbreviated 5-hmC) in smooth muscle cells, which is an oxidation product of 5-methylcytosine (5-mC) mediated by TET enzymes. This insufficient modification of DNA in smooth muscle cells is probably a memory of epigenetic memory, which can cause the inflammatory processes that once occurred to be relived over and over again. I was thrilled and hope to have found an approach for the development of new therapy to break the vicious circle of chronic inflammation in the lung.

My next professional station

I continue my research on the link between RNA-based transcription regulation and activation of innate immune responses as a postdoc at the Max Planck Institute for Heart and Lung Research.

The Nobel Laureate Fellowship

The Nobel Laureates of the Max Planck Society can each nominate an outstanding postdoc for a Nobel Laureate Fellowship in recognition of their achievements. The fellows receive an employment contract at a Max Planck Institute as well as resources for research.

This instrument for promoting junior scientists of the Max Planck Society provides postdocs with a unique insight into the research activities of the Nobel Laureates. They also benefit from excellent national and international networks for their future career.



Dr. phil. nat. Di Wu

Nobel Laureate:
Prof. Dr. Dr. h.c. Hartmut Michel

Max Planck Institute of Biophysics,
Frankfurt am Main

Research field: Structural Biology and Protein
Biochemistry

Current activity: Postdoctoral Researcher at
the Max Planck Institute of Biophysics



My topic of interest

Given their vital roles in human physiology, including the facilitation of amino acid transport across cell membranes, my scientific focus is on understanding the molecular mechanisms of membrane proteins using structural biology approaches. My work revealed the mode of action of a human amino acid transport complex and provided unprecedented insights into these clinically relevant but poorly characterized membrane proteins.

My motivation

Membrane proteins are estimated to account for over 60% of currently marketed drug targets, yet many of these important proteins remain poorly understood due to their intricate nature. I believe that a comprehensive understanding of membrane proteins is imperatively needed, which forms the basis for development of new approaches to alter functions of cells in clinical therapies and attain improved drug design strategies for the treatment of various diseases. As a researcher in this field, I am motivated by the potential of my work to make meaningful contribution and impact more people.

My next
professional station

I am currently continuing our work on molecular membrane biology with Prof. Hartmut Michel in his group as a post-doctoral researcher. My long-term aspiration is to pursue research in the field of my interest within the academic community.

