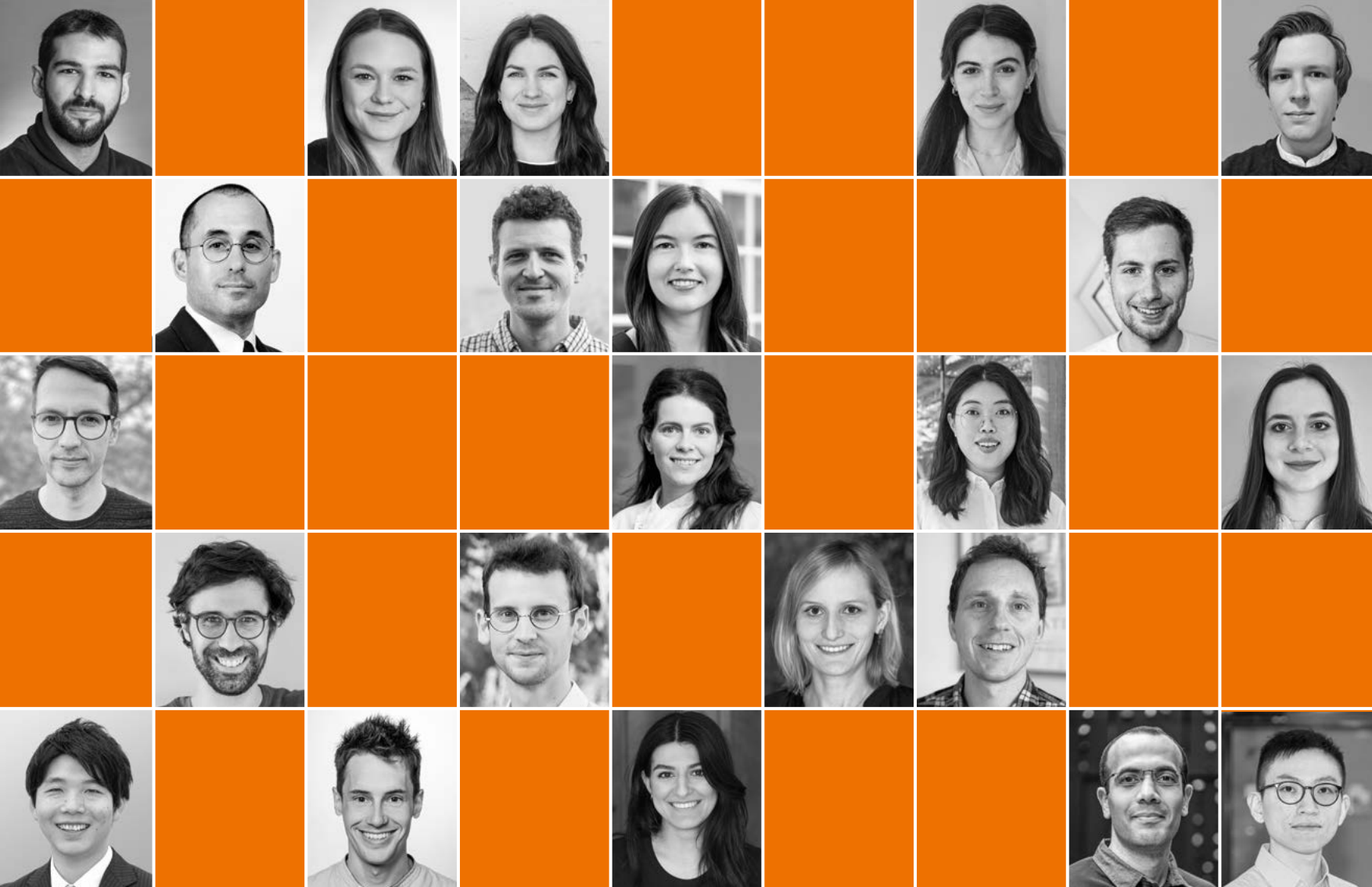
Outstanding!

Junior scientists of the Max Planck Society 2024



Contents

Outstanding!

Dear Members and Friends of the MPG Community,

In April, I attended an outstanding lecture by an enthusiastic young scientist in Seoul, South Korea. Afterwards, as I got to congratulate him, he proudly told me that he had received the Otto Hahn Medal a few years ago.

This shows that it is all about spotting and promoting outstanding talents early in their careers. At the Max Planck Society, we also support researchers from our own ranks who then pursue their chosen paths with us or elsewhere. Science is a global activity, and so we need the international community.

On each page of this brochure, you get to know an excellent researcher. You will learn about the scientific achievements of these young academics that are being honoured. One thing is for sure: An immense amount of work has gone into each individual project. Our award winners can be really proud of what they have achieved. Performance and merits count at the Max Planck Society.

Along the way, our brochure also offers insights into the large variety of topics of research conducted within the Max Planck Society. The many different perspectives from which scientists look at the world fascinate me.

And this is another reason why I am looking forward to meeting the awardees in person at our General Meeting in Berlin. Let us seize this opportunity for exchange across the boundaries of scientific disciplines and career stages. This, after all, is how an award becomes what it is meant to be: A recognition for achievements, a door opener and an incentive for future endeavours. Our young colleague in South Korea represents only the most recent example of how this idea becomes reality.

With my best wishes

Patrick Cramer
President of the Max Planck Society

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.

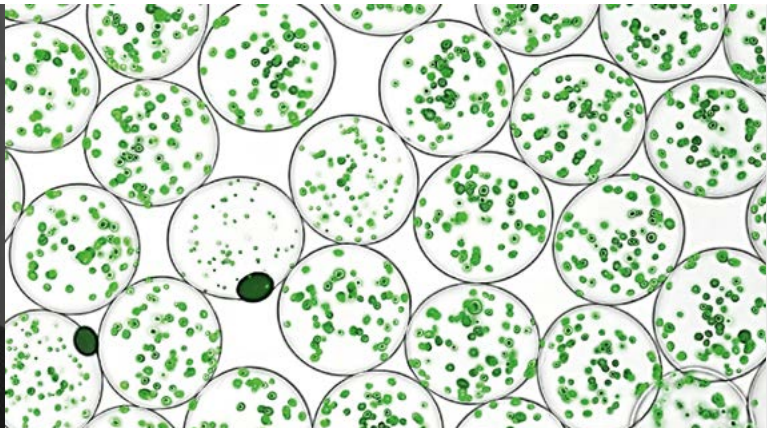
Usually, the award is presented during the General Meeting in the following year.

Dr. rer. nat. Nadya Abbood

for the application and optimization of synthetic protein-zippers for the engineering of non-ribosomal peptide synthetases

Max Planck Institute for Terrestrial Microbiology, Marburg
Research field: Natural Product Research
Current activity: Up until my research stay in the USA at Yale University, I am volunteering for various social projects with Caritas.

My topic of interest: Many essential drugs are derived from natural products produced by fungi and bacteria. My research has focused on how to produce new synthetic natural products by reprogramming natural product-producing enzymes, in particular non-ribosomal peptide synthetases, to generate new bioactive compounds. In my PhD thesis, I succeeded in establishing a method for the high-throughput production and screening of synthetic natural products.
My motivation: It's great to know that my work provides starting points for drug development and thus serves a social purpose. I have also always been passionate about science. I find it exciting to understand how biological systems work and how we can benefit from them. Nature is incredibly complex and there is so much we can learn from it.
My next professional station: My next professional goal is a postdoctoral research stay in the USA. At my host institute, I plan to work on small molecules from the human microbiome.

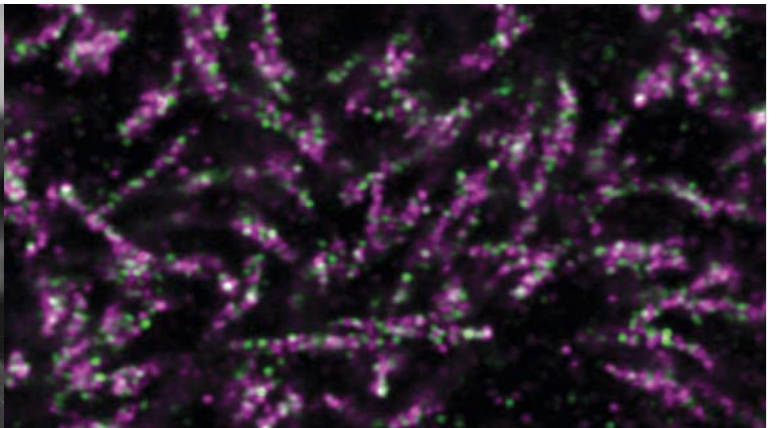


Dr. rer. nat. Ida Marie Astad Jentoft

for groundbreaking findings on the storage of proteins during oocyte development and early embryogenesis in mammals

Max Planck Institute for Multidisciplinary Sciences, Göttingen
Research field: Molecular Biology
Current activity: Postdoctoral Fellow at the Research Institute for Molecular Pathology, Vienna

My topic of interest: Many of the proteins and mRNA transcripts that the embryo needs just after fertilization, are provided by the egg cell. With my research, I want to understand how the egg cell accumulates and stores these factors and thus prepares for embryogenesis even before fertilization has taken place.
My motivation: I am fascinated by the very first stages of life, and how animal life has evolved different strategies for reproduction. Being in a stimulating scientific environment where I can ask and try to answer fundamental biological questions is one of the things that motivate me the most.
My next professional station: I recently joined Andrea Pauli's lab at the Research Institute for Molecular Pathology in Vienna where I will continue to explore early development and the molecular mechanisms regulating embryonic dormancy in killifish.

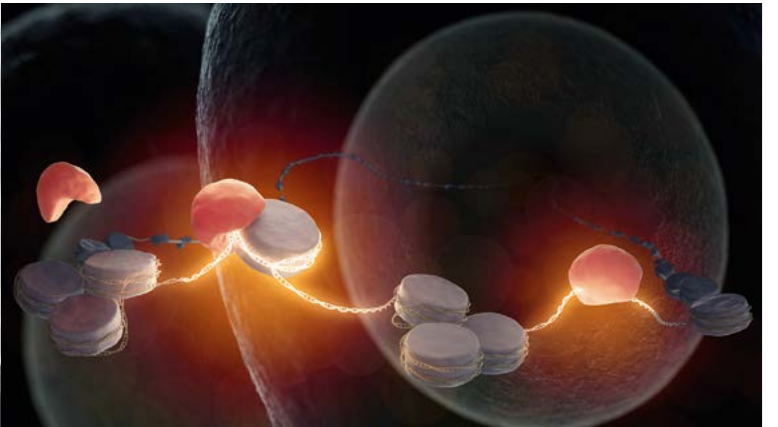


Johanna Gassler, PhD

for the discoveries that the genome is transcriptionally ›awakened‹ by Nr5a2 and spatially reorganized in early mouse embryos

Max Planck Institute of Biochemistry, Martinsried
Research field: Molecular Developmental Biology

My topic of interest: The research question that fascinates me is how the fusion of two terminally differentiated cells can generate a cell that is able to give rise to an entire multicellular organism. This ability is termed ›totipotency‹. During the course of my PhD studies, I unraveled new aspects of this transition with special emphasis on the 3D chromatin organization and identifying new regulators of zygotic genome activation and early mammalian embryonic development.
My motivation: What excites me about science is that there is so much we don't know yet. I enjoy working in a multidisciplinary team, tackling complex questions from different perspectives, and learning from others. I love solving a little part of the puzzle of a research question, but I am even more excited when it leads to several new questions that I can follow up in future.
My next professional station: I plan to continue my scientific research in a postdoc position and am currently deciding on where.

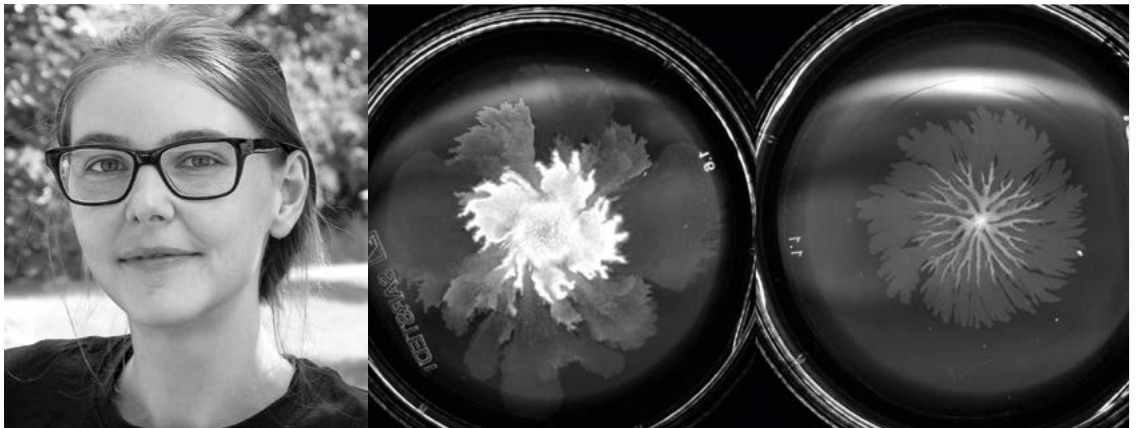


Dr. rer. nat. Hannah Jeckel

for the investigations of the spatiotemporal development of microbial communities

Max Planck Institute for Terrestrial Microbiology, Marburg
Research field: Physics
Current activity: Postdoctoral researcher at the California Institute of Technology

My topic of interest: How do bacteria organize into communities? What are the dominant mechanisms and interactions that shape community structure?
My motivation: Living systems are incredibly beautiful, and I feel extremely lucky to be able to appreciate this beauty through my work, a lot of which focuses on microscopy and image analysis. I love collaborating with other scientists to solve the little puzzles of our research – it is such an enriching experience to come together with people from different backgrounds and disciplines and learn from their perspective.
My next professional station: I just started a postdoctoral position in the lab of Dianne Newman at Caltech, where I study plant-microbe interactions using imaging-based technologies.

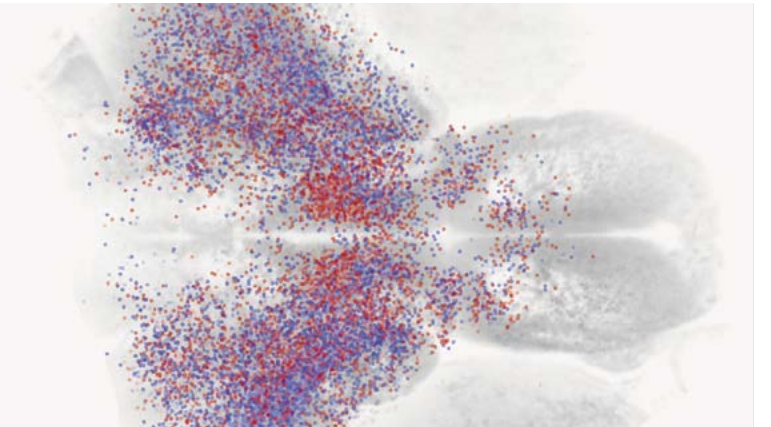


Johannes Maximilian Kappel, PhD

for the discovery of a visual pathway that allows an animal to recognize conspecifics and to initiate social behaviour

Max Planck Institute for Biological Intelligence, Martinsried
Research field: Neuroscience
Current activity: Postdoctoral Fellow at the Friedrich Miescher Institute for Biomedical Research, Basel

My topic of interest: How do brains enable social recognition? I discovered a neural circuit in the visual system of the developing zebrafish brain that specifically detects motion patterns of conspecifics, is essential for social affiliation behaviour and synaptically connected to evolutionarily conserved brain regions that control social behaviours.
My motivation: I am fascinated by the ability of our brains to create immersive inner worlds that enable an adaptive perception of our environment. The incredible structural complexity of the responsible neural circuits is deeply impressive to me and motivates me to gain a deep understanding of the underlying mechanisms. Despite great progress, many fundamental questions in the field of perception have not been solved for either biological or artificial neural networks and promise convergent developments in the future, in which I would like to take part.
My next professional station: Currently, I am employed as a Postdoctoral Fellow at the Friedrich-Miescher-Institute for Biomedical Research in Basel. I am reconstructing the synaptic connectivity of all neurons in the developing zebrafish forebrain via volume electron microscopy. In combination with activity recordings of the same neurons, I will research the architecture and mechanisms underlying a neural circuit for spatial navigation.

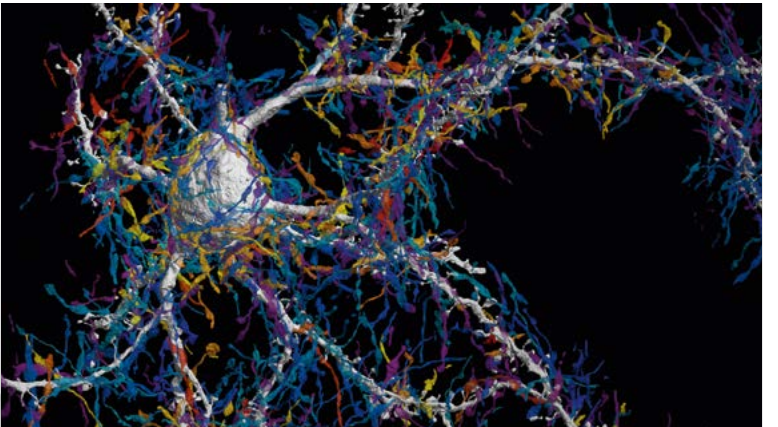


Dr. sc. Alessandro Motta

for the development of connectomic analysis methods that led to the identification of memory traces and the inhibitory-to-excitatory balance in cortical connectomes

Max Planck Institute for Brain Research, Frankfurt am Main
Research field: Neuroscience
Current activity: Research associate at the Lucerne University of Applied Sciences and Arts

My topic of interest: What are the neuronal circuits that give rise to our cognitive capabilities? And are there still efficient signal processing and learning algorithms to be discovered in the brain, which have escaped computer scientists so far? I am as curious about these questions as on the first day of my internship.
My motivation: Over the course of this work, I have noticed that I get more joy out of the research process than out of the research outputs. There is nothing quite as motivating as the thrill of overcoming a challenging problem after butting my head against it for a while. Being able to immerse myself this deeply in interesting research questions and to work with a great team are privileges for which I am thankful to the Max Planck Society.
My next professional station: I am currently working as a research associate at the Lucerne University of Applied Sciences and Arts, where I pursue data-driven innovation projects for improving the sustainability of food systems.



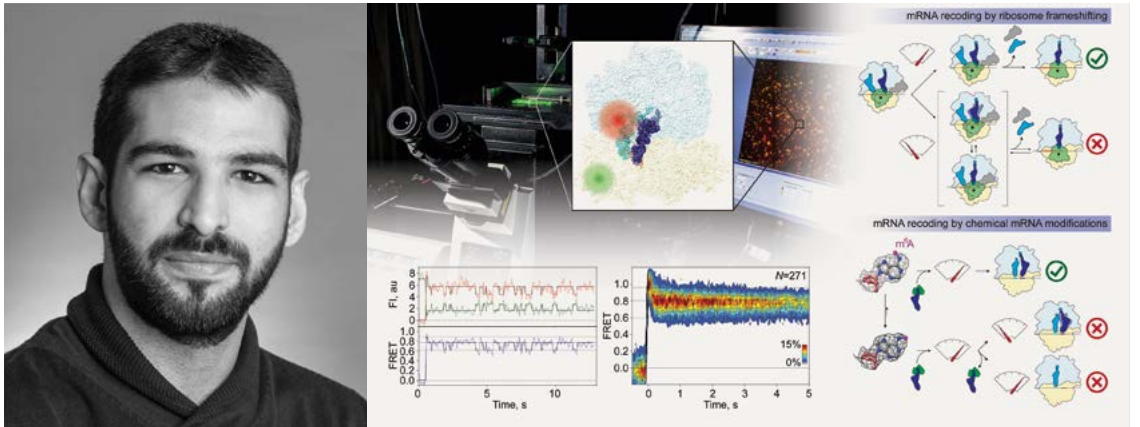
Dr. rer. nat. Panagiotis Poulis

for solving mechanisms of mRNA recoding by frameshifting and chemical modifications using single molecule approaches

Max Planck Institute for Multidisciplinary Sciences, Göttingen
Research field: Biochemistry
Current activity: Postdoctoral researcher at the Max Planck Institute for Multidisciplinary Sciences

My topic of interest: My research addresses how specific mRNA features, such as special base motifs and chemical modifications, affect mRNA translation. This knowledge can provide insights into dysregulation of mRNA translation in diseases and development of novel mRNA therapeutics.
My motivation: I am highly motivated by the potential and momentum that RNAbears for therapeutics. The unfathomable realm of RNA-based approaches will extend our current repertoire against challenging diseases. I am certain that the new knowledge from basic research on the mechanisms and plasticity of mRNA translation will contribute to the current therapeutic applications.
My next professional station: I am continuing and deepening my research as a postdoctoral researcher at the Max Planck Institute for Multidisciplinary Sciences.

Biology & Medicine Section

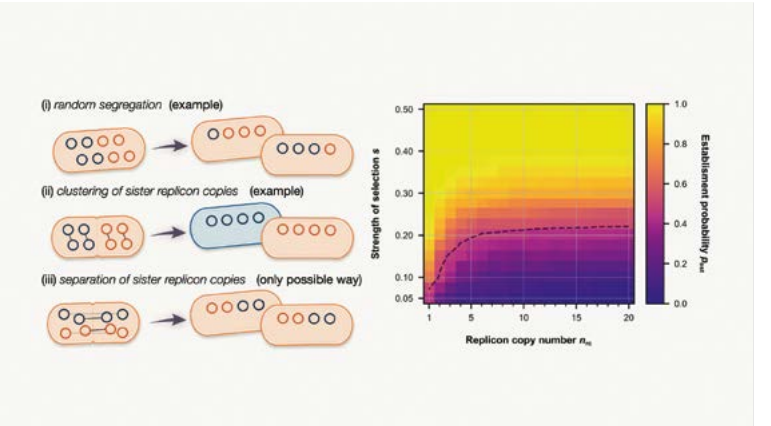


Dr. rer. nat. Mario Santer

for the study of bacterial evolution and the development of fundamental population genetics theory for bacteria

Max Planck Institute for Evolutionary Biology, Plön
Research field: Evolutionary Theory, Bacterial Evolution
Current activity: Postdoctoral Fellow at the Institute for General Microbiology, Kiel University, Germany

My topic of interest: Many bacteria carry plasmids – a form of extrachromosomal DNA that is independently replicated from the bacterial chromosome. Plasmids are mainly known to encode antibiotic resistance. Individual bacterial cells often contain several copies of a plasmid. This has crucial consequences for the evolution of a bacterial population, for example, when bacteria are exposed to antibiotic therapy. In my doctoral thesis I investigated the influence of the copy number of a plasmid on the probability and dynamics of resistance evolution. To tackle the complex population genetics and inheritance of plasmids, I developed mathematical models that were successfully used to predict the allele dynamics in evolution experiments.
My motivation: The development of mathematical models for studying the spread of bacterial resistance mutations requires the application of interdisciplinary knowledge of genetics, microbiology, and evolutionary biology. I was mainly motivated by applying interdisciplinary methods from mathematics and biology and collaborating with experimental researchers during my doctoral thesis.
My next professional station: Since January 2023, I have been working as a postdoctoral researcher in Tal Dagan's group at Kiel University.

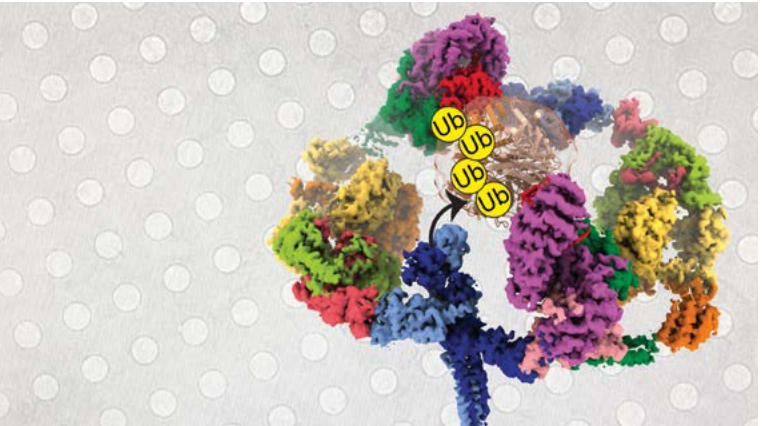


Dr. rer. nat. Dawafuti Sherpa

for establishing a new paradigm for substrate targeting by E3 ubiquitin ligases and ubiquitin-dependent regulation of metabolism

Max Planck Institute of Biochemistry, Martinsried
Research field: Biochemistry and Structural biology
Current activity: Postdoctoral Fellow at the Harvard Medical School, Boston, USA

My topic of interest: A vast diversity of protein machineries actively orchestrate the cellular environment. The controlled synthesis and precise regulation of these protein machineries, as well as their timely degradation, are crucial for maintaining cellular health. My goal lies in mechanistically comprehending how gatekeeping protein machineries oversee the various stages from protein synthesis to degradation, and how they maintain cellular equilibrium amidst stress or disease conditions.
My motivation: During my graduate studies I delved into the comprehension and visualization of the E3 ubiquitin ligases that recognize and tag a variety of substrates (other proteins, lipids, carbohydrates, etc.) with ubiquitin molecules as a signal for either protein degradation, translocation or signalling. This experience and the thrill of being in such a stimulating research environment are the driving forces for my scientific pursuit. I believe that being able to decipher how alterations in the cellular milieu manifest at the molecular level is crucial for understanding fundamental cellular mechanisms.
My next professional station: Currently, I am a postdoctoral researcher at Harvard Medical School in Boston, USA.



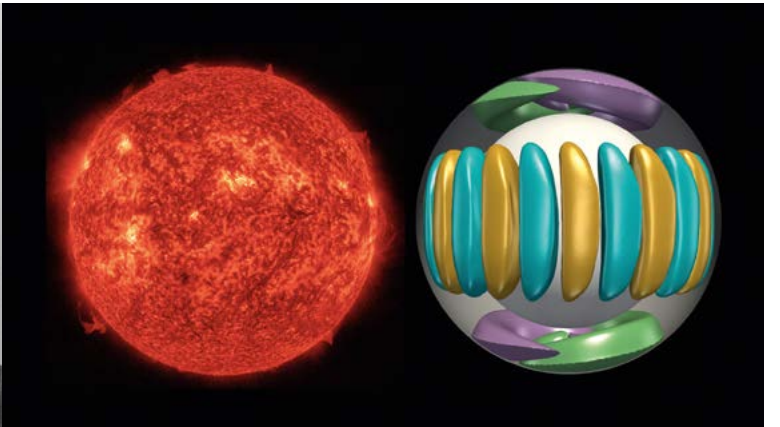
Yuto Bekki, PhD

for his work on the theory of solar oscillations in the inertial frequency range, which paves the way to constraining the properties of the deep solar convection zone

Max Planck Institute for Solar System Research, Göttingen
Research field: Solar Physics
Current activity: Postdoctoral Researcher at the Max Planck Institute for Solar System Research

My topic of interest: How does the plasma flow inside the Sun? How does the turbulent convection interact with rotation and magnetic fields? How beneficial are the inertial oscillations in understanding the dynamics in the Sun?
My motivation: The Sun, our closest star, remains shrouded in numerous mysteries. In particular, understanding what is happening inside the Sun is not easy. I found it very exciting to mobilize all the available knowledge and tools – from numerical simulations to a multitude of solar surface observations including the newly-discovered inertial modes – to crack this mystery.
My next professional station: I am currently continuing my research at MPS as a postdoc of the WHOLESUN project.

Chemistry, Physics & Technology Section



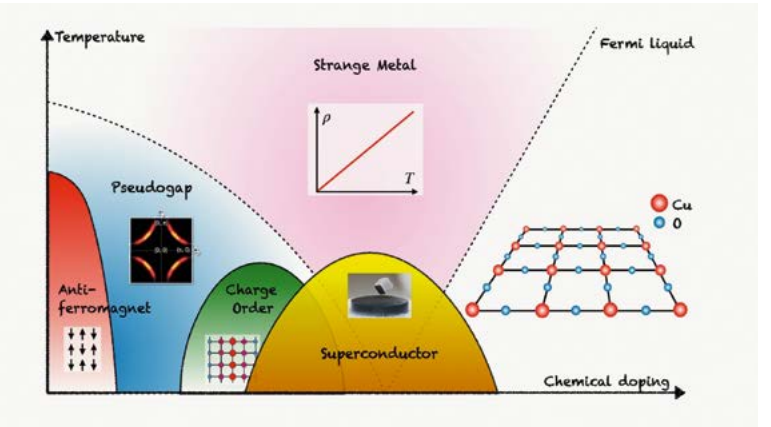
Dr. rer. nat. Pietro Maria Bonetti

for the derivation of exact Ward identities in antiferromagnets and their application to a gauge theory of the pseudogap phase in high temperature superconductors

Max Planck Institute for Solid State Research, Stuttgart
Research field: Condensed Matter Theoretical Physics
Current activity: Postdoctoral Researcher at the Harvard University, Cambridge, USA

My topic of interest: My research goal is to gain an understanding of how new phases of matter can arise through strong interactions between electrons. This is particularly relevant for high-temperature superconductors, whose phase diagrams display several, often competing phases of matter.
My motivation: I am fascinated by the concept of emergence, according to which the properties of a system cannot be described in terms of the properties of its mutually interacting components. I apply this concept to high-temperature superconductors to provide the collectivity with an understanding of the microscopic processes occurring in strongly interacting materials. My hope is that this may stimulate further resarch for technological applications.
My next professional station: I am currently working as a postdoctoral researcher at Harvard University with a fellowship of the Leopoldina Academy of Sciences.

Chemistry, Physics & Technology Section

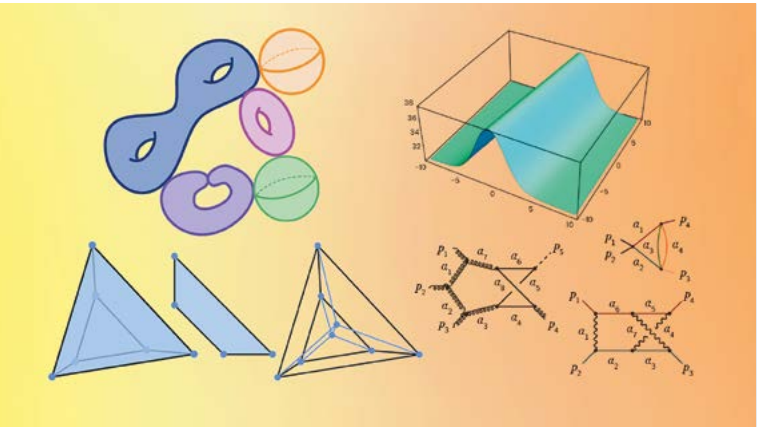


Dr. rer. nat. Claudia Fevola

for the substantial contributions at the interface of algebraic geometry, computational mathematics, and fundamental physics

Max Planck Institute for Mathematics in the Sciences, Leipzig
Research field: Algebraic Geometry and Nonlinear Algebra
Current activity: Postdoctoral Researcher at the Inria Saclay, France

My topic of interest: I work at the interface between mathematics and its applications in physics. My works concern the study of solution sets of polynomial equations that arise from the study of two main physical objects: soliton solutions to the Kadomtsev-Petviashvili equation and Feynman integrals in scattering amplitudes.
My research provides new algebraic models to foster the synergy between algebra, geometry, and physics. As such, it seeks to result in significant advances in both mathematics and physics.
My motivation: Each research question presents a narrative, and I'm intrigued to uncover the next chapter. I really want to see how the story ends. It is surprising how much abstract algebra and geometry can turn out useful to problems in physics ranging from elementary particle interactions to water wave evolution.
I consider it a privilege to have the possibility of interacting with passionate mathematicians and physicists. The ideas I learn from this exchange fuel my enthusiasm.
My next professional station: I currently pursue my research career as a postdoc at the research institute Inria in Saclay, France.



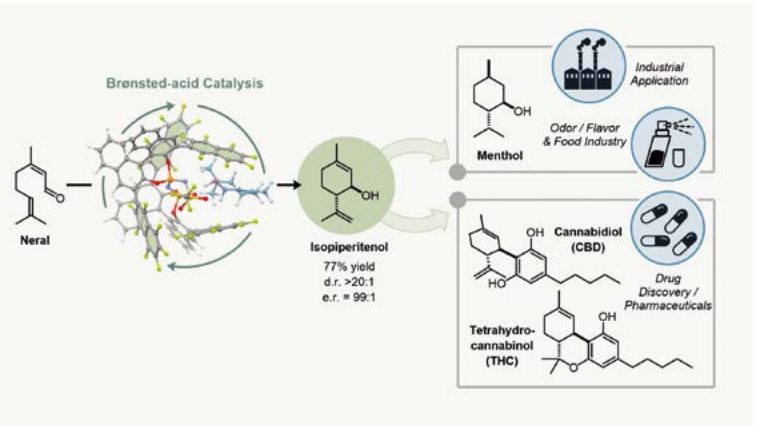
Dr. rer. nat. Joyce Antonia Anna Grimm

for her development of a catalytic cyclization of neral to isopiperitenol and the synthesis of menthol and various cannabinoids

Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr
Research field: Homogeneous Catalysis
Current activity: Postdoctoral Fellow at the Institute for Chemical Reaction Design and Discovery (ICReDD), Sapporo, Japan

My topic of interest: The selective transformation of the fine chemical neral into isopiperitenol resembles a significant challenge, as the desired monoterpene alcohol is unstable under the required reaction conditions. With the help of recently introduced sterically demanding catalysts, known as ›Confined Organocatalysts,‹ I could successfully obtain the desired product with high efficiency and excellent levels of selectivity. This novel method enabled us to use isopiperitenol in the synthesis of pharmaceutically-relevant cannabinoids and menthol, ultimately opening new possibilities in chemical research and industry.
My motivation: Driven by my curiosity and thirst for knowledge, I am fascinated by fundamental research projects in the field of catalysis, which additionally stand out due to their high societal relevance. Particularly motivating is the opportunity to explore new paths with the help of catalysts, paths that were previously deemed impossible and existed only on paper.
My next professional station: Currently, I am working as a postdoctoral fellow at the Institute for Chemical Reaction Design and Discovery (ICReDD), focusing on computational methods. Towards the end of this year, I will relocate to Aachen to continue my academic work with Prof. Dr. Daniele Leonori in the field of photo-catalysis at the RWTH Aachen.

Chemistry, Physics & Technology Section



Mohammed Khalil, PhD

for his work enabling precision improvements of theoretical predictions for gravitational-wave astronomy, in Einstein's theory of General Relativity and beyond

Max Planck Institute for Gravitational Physics (Albert-Einstein-Institut) Potsdam
Research field: Gravitational-Wave Physics
Current activity: Postdoctoral Fellow at the Perimeter Institute for Theoretical Physics, Waterloo, Canada

My topic of interest: My research focuses on analytical approximation methods for the dynamics of compact binaries, with the goal of improving gravitational waveform models.
My motivation: Gravitational-wave observations have revolutionized our understanding of black holes and neutron stars, their properties, and astrophysical binary formation channels. Searching for gravitational-wave signals and inferring their parameters crucially requires accurate waveforms. This motivates me to develop theoretical predictions for gravitational waves that cover the wide range of parameter space of binary systems. I am also fascinated by all aspects of gravity, which governs the Universe at the largest scales.
My next professional station: I am currently a postdoctoral fellow at Perimeter Institute for Theoretical Physics, where I continue to explore binary dynamics in General Relativity.

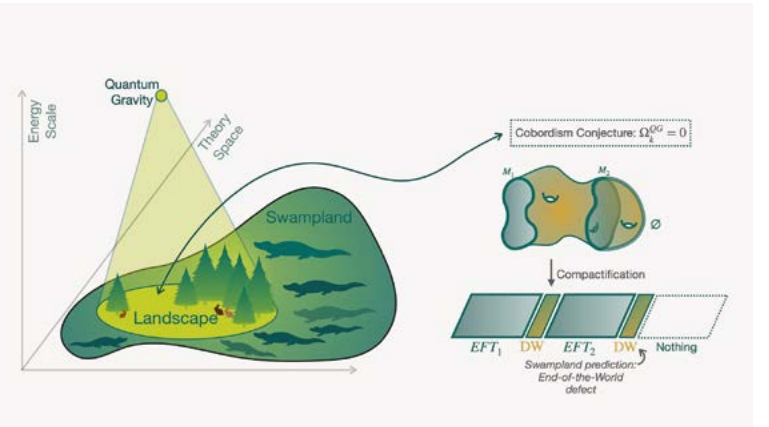
Dr. rer. nat. Andriana Makridou

for her work on the string theoretic Swampland Program and in particular for novel contributions to the Cobordism Conjecture

Max Planck Institute for Physics (Werner-Heisenberg-Institut), München
Research field: String Theory
Current activity: Postdoctoral researcher at the Institute for Theoretical Physics (IFT) UAM-CSIC, Madrid

My topic of interest: The Swampland Program aims to uncover the fundamental constraints that are required to make a gravitational effective field theory compatible with the quantum aspects of gravity. I am interested in using Swampland constraints in a two-fold manner: both as a guiding principle towards describing our world using String Theory and also to more deeply understand aspects of string theory itself.
My motivation: I am fascinated by the complex interplay of physics and mathematics that is necessary to formulate a consistent theory of Quantum Gravity, such as String Theory. I hope that I can contribute towards better understanding this beautiful, yet elusive, corner of high-energy-physics, and I am looking forward to drawing connections with other important physical questions, such as the birth and the eventual fate of our universe.
My next professional station: I am continuing my research in string phenomenology and in particular in the Swampland Program at the Institute for Theoretical Physics (IFT) UAM-CSIC in Madrid.

Chemistry, Physics & Technology Section

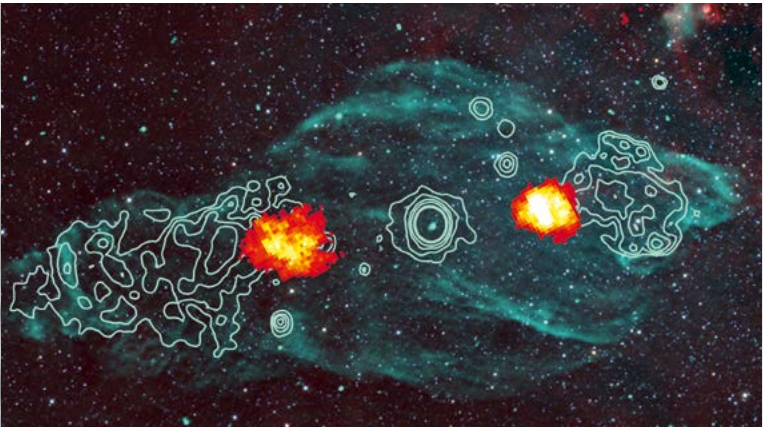


Dr. rer. nat. Laura Olivera-Nieto

for investigations of particle acceleration in astrophysical jets, the development of a novel background rejection method and improvements to the data analysis software

Max Planck Institute for Nuclear Physics, Heidelberg
Research field: Astro-particle Physics
Current activity: Postdoctoral Fellow at the Max Planck Institute for Nuclear Physics

My topic of interest: Some extreme environments in the Universe are able to accelerate particles up to the highest energies ever measured. My current research focuses on a class of such environments: the giant and powerful outflows arising near black holes. Using telescope observations in the very-high-energy gamma-ray range of the electromagnetic spectrum, I try to answer the question of how exactly do these very large outflows manage to transfer so much energy to subatomic particles.
My motivation: While humans have to build extremely complex and advanced machines to accelerate particles, some places in the Universe seem to do it effortlessly. In my research I get to use these environments as a laboratory, one larger and more powerful than any human-made device would ever be. Additionally, detecting astrophysical gamma-ray radiation from Earth is challenging because the atmosphere blocks it. Nevertheless, the field has developed clever techniques which make gamma-ray astronomy a reality, which I find inspiring.
My next professional station: In October 2024 I will start a postdoctoral position at the University of Amsterdam.

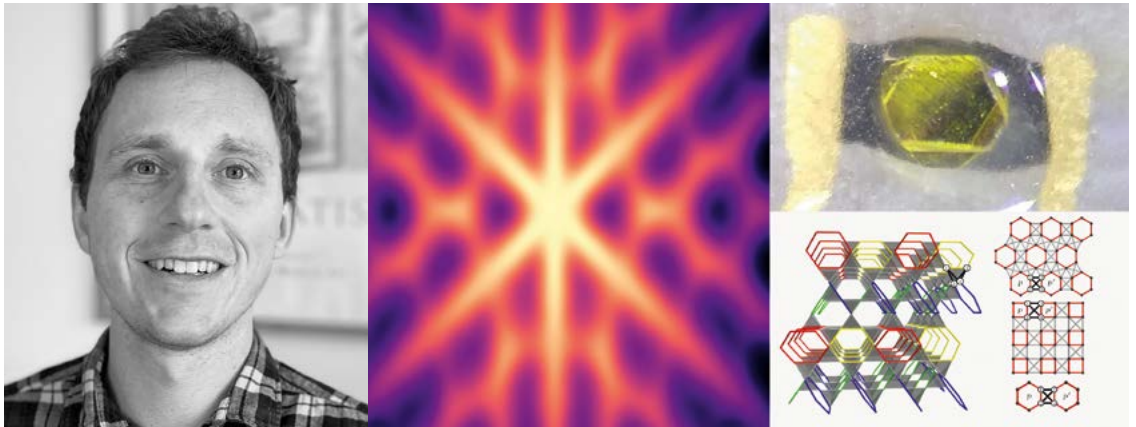


Dr. rer. nat. Robin Schäfer

for methodologically and conceptually groundbreaking work on exotic, in particular spin liquid, phases of three-dimensional quantum magnets

Max Planck Institute for the Physics of Complex Systems, Dresden
Research field: Condensed Matter Theory
Current activity: Postdoctoral Fellow at the Boston University, USA

My topic of interest: As a theoretical condensed matter physicist, my research focuses on the intriguing domain of quantum mechanics and the fascinating states of matter it reveals. One major question I investigate is to what extent these exotic quantum states predicted by theory actually exist in nature. Is it possible to stabilize these states in materials or modern quantum devices? If so, can we harness their unique properties to advance the development of future quantum computers? Among others, these are questions that I am addressing in my research.
My motivation: Since childhood, I have wondered about the underlying principles that govern the complexity of our world. Through my research I approach this topic from a fundamental perspective. While I unravel small mysteries, I constantly encounter new puzzles to solve. It is this continuous cycle of untangling existing problems and uncovering new ones that motivates me.
My next professional station: Currently, I am applying for fellowships to extend my stay in Boston and benefit from the thriving scientific community. My long-term goal is an academic career in Germany.



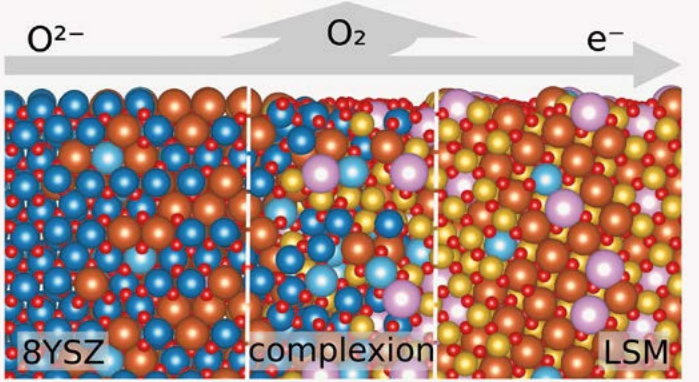
Dr. rer. nat. Hanna Christine Türk

for ground-breaking work elucidating the atomic-scale degradation mechanism of working interfaces in solid oxide electrolyzers

Fritz Haber Institute of the
Max Planck Society, Berlin
Research field: Theoretical Chemistry
Current activity: Postdoctoral Fellow at the Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland

My topic of interest: Finding efficient and durable energy storage solutions is essential in our energy-hungry world. I focus on the deactivation of energy materials and would like to find solutions to increase their lifetime.
My motivation: Investitating fundamental details about the behavior of materials is facinating. There are endless possibilites of research directions, and I am happy to learn something new every day by following them.
My next professional station: I am learning about machine learning based methods for efficient simulation of different materials as a postdoctorial researcher at EPFL, Switzerland.

Chemistry, Physics & Technology Section



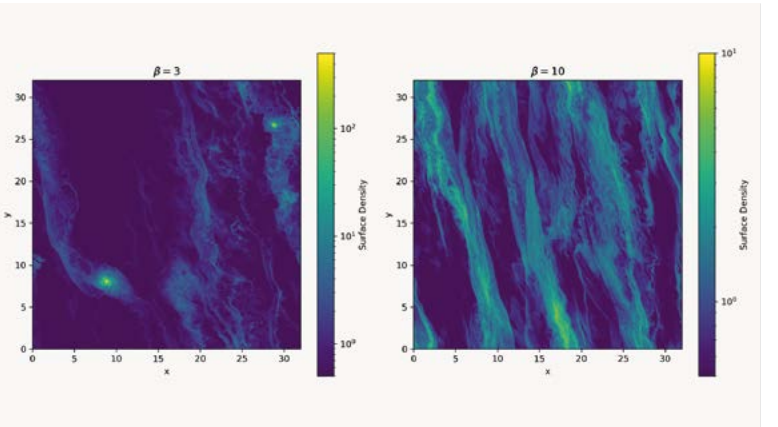
Dr. rer. nat. Oliver Zier

for the development of novel numerical techniques that allow the accurate simulation of rotationally supported, cold, magnetized astrophysical disks

Max Planck Institute for Astrophysics (MPA), Garching
Research field: Numerical astrophysics
Current activity: Postdoc at the Massachusets Institute of Technology (MIT)

My topic of interest: I am developing and applying new numerical techniques to analyze different astrophysical systems. For my Ph.D., I applied the so-called moving mesh method to rotating disks, which are inherently difficult to simulate due to their highly supersonic motions.
In my thesis, I significantly improved the accuracy of this method and showed that its flexibility allows us to study certain questions in those systems with unprecedented accuracy.
My motivation: Astrophysical research covers an extraordinary range of scales, from the subatomic level to the vastness of the universe and from the present back to the origins of the cosmos. Ever since I read Steven Hawking's book ›The Universe in a Nutshell‹ as a child, I have been fascinated by this complexity.
My next professional station: In September I will start an ITC Postdoc Fellowship at the Harvard College Observatory. There I will study the early universe with the help of computer simulations.

Chemistry, Physics & Technology Section

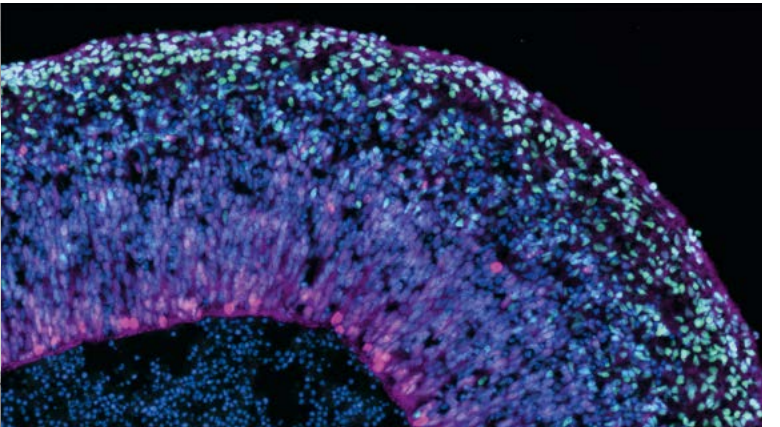


Dr. Joery den Hoed

for his work uncovering distinct molecular effects of DNA variants in single-gene disorders that disrupt neurodevelopment and speech

Max Planck Institute for Psycholinguistics, Nijmegen (NL)
Research field: Human Genetics
Current activity: Product Developer newborn screening at MRC Holland, Amsterdam, the Netherlands

My topic of interest: In my research I aim to learn more about how genetic and molecular mechanisms underlie the variability in clinical outcome of rare neuro-developmental and speech disorders. I do so by using a combination of different functional assays, including physiologically-relevant cell models of early brain development and high-throughput experiments to study basic protein functions.
My motivation: Neurodevelopmental disorders are too complex to understand from one disciplinary angle. One of my main drives in doing my research is to work at the intersection of different disciplines and to bring different fields together. I believe that teaming up closely with clinicians, bioinformaticians, biologists, and geneticists, ultimately creates the biggest impact. Integrating the information from all those different approaches, and putting the puzzle pieces together to build a complete picture motivates me the most.
My next professional station: After my PhD, I decided that I wanted to continue contributing to projects that impact the well-being of children and their families. Therefore, I recently started at MRC Holland in Amsterdam, where I work on the development of accessible and affordable genetic assays for screening of newborns.



Dr. jur. Irene Domenici

for the comparative legal study on the preservation of ethical neutrality in the introduction of controversial biotechnologies into public health systems

Max Planck Institute for Social Law and Social Policy, München
Research field: Health Law, Comparative Constitutional Law
Current activity: Senior Researcher at the Max Planck Institute for Social Law and Social Policy

My topic of interest: To what extent can ethical concerns be considered in coverage and reimbursement decisions of public healthcare systems? By adopting the position that the state must act in an ethically neutral manner my dissertation provides a critical legal analysis of the relationship between ethics and law and its implications for the public healthcare system. It combines a comparative, legal-constitutional perspective with the investigation of two case studies: preimplantation genetic diagnosis and non-invasive prenatal testing.
My motivation: As a legal scholar, I have always been extremely curious about how different jurisdictions tackle the same legal problem. I am also passionate about matters related to reproductive health. My thesis allowed me to combine those two interests.
My next professional station: I am a Senior Researcher at the Max Planck Institute for Social Law and Social Policy and I am coordinating a project on Minimum Income Protection.

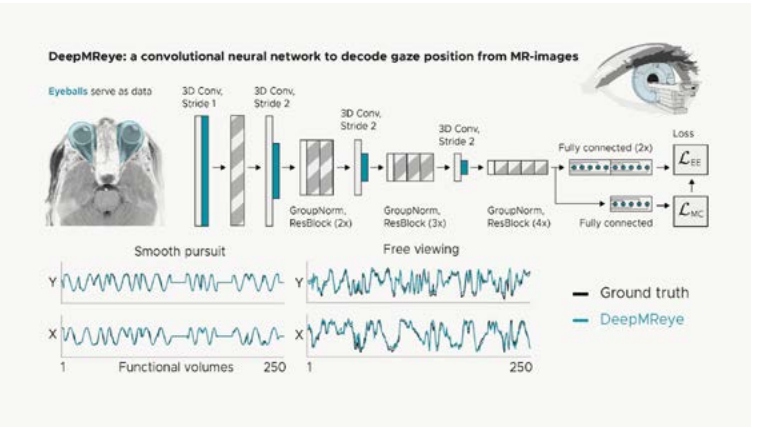
Markus Frey, PhD

for groundbreaking discoveries at the interface between neuroscience and artificial intelligence

Max Planck Institute for Human Cognitive and Brain Sciences Leipzig & Norwegian University of Science and Technology
Research field: Neuroscience
Current activity: Postdoctoral researcher at the École polytechnique fédérale de Lausanne (EPFL), Switzerland

My topic of interest: Modern machine learning algorithms have opened up new avenues for the analysis of neuroscience data. In my research, I investigate how these models are able to explain large-scale datasets gathered from various recording techniques, including fMRI and electrophysiology.
My motivation: We live at a time where many fundamental questions about brain functionality remain unanswered. In particular, how does the brain process sensory information to create a stable, movement-independent map of the world around us. In addition to advancing machine learning tools, I want to further uncover the evolution of these cognitive processes and ideally understand why neurodegenerative diseases disrupt them.
My next professional station: I am currently a postdoctoral researcher at EPFL in Lausanne, continuing my work in the intersection between artificial intelligence and neuroscience.

Human Sciences Section

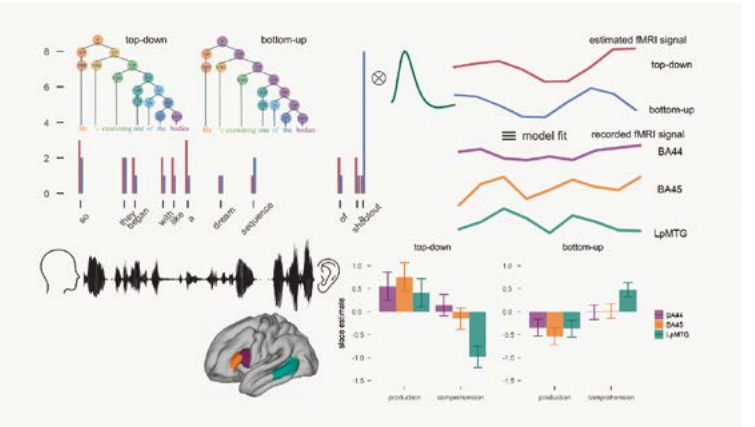


Dr. Laura Giglio

for research on the neurobiological infrastructure for speaking (language production) in humans

Max Planck Institute for Psycholinguistics, Nijmegen (NL)
Research field: Cognitive neuroscience, psycholinguistics
Current activity: Postdoctoral fellow at the Center for the Study of Aphasia Recovery at the University of South Carolina, USA

My topic of interest: Language is exchanged through both speaking and listening. However, most brain research on language focuses on comprehension. In my research, I have attempted to learn more about the neural resources for speaking and to better understand the relationship between the brain systems for speaking and listening.
My motivation: As humans, we use language constantly almost effortlessly. We appreciate the importance of our ability to use language when it breaks down, such as in post-stroke aphasia. It is critical that we better understand how language is implemented in the brain to eventually guide research on aphasia recovery. Investigating similarities and differences in speaking and listening provides a window into the neurocognitive processes underlying language.
My next professional station: I am now a postdoc at the University of South Carolina, where I investigate the relationship between language and the brain in individuals who have partly lost language function due to a brain lesion (post-stroke aphasia).

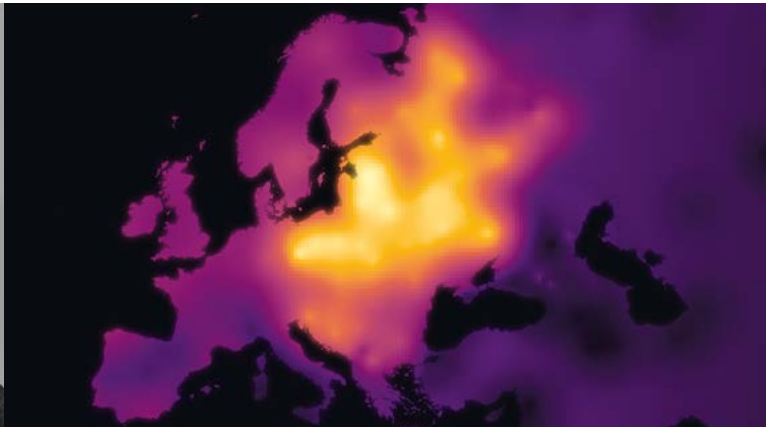


Dr. rer. nat. Joscha Gretzinger

for the interdisciplinary archaeogenetic work on the demographic history and social organization of central and northern Europe during the Iron Age and Medieval Period

Max Planck Institute for Evolutionary Anthropology, Leipzig
Research field: Archaeogenetics
Current activity: Postdoctoral Fellow at the Max Planck Institute for for Evolutionary Anthropology

My topic of interest: My aim is to understand how microevolutionary and demographic trajectories of the recent past have not only influenced the genetic diversity but also organization of past societies. Through the combination of ancient DNA and archaeology, we can reconstruct continental-scale migrations just as well as local family networks, shedding light on both population changes and political systems and social values where no written records exist.
My motivation: Archaeogenetics is detective work, I have to combine lines of evidence from anthropology, history, archaeology and ancient DNA. I enjoy this challenging interplay between the humanities and natural sciences, searching for synergies between the disciplines and applying quantitative approaches and models to reconstruct the history and society of long-lost civilizations and people. Yet, the highlight of my work is clearly its diversity, one day I can work on genomes from Stone Age South Africa and deep evolutionary history, the other day I re-construct the pedigree of Iron Age Celtic princes from the South of Germany.
My next professional station: I continue my research as part of the HistoGenes Project at the Max Planck Institute for Evolutionary Anthropology, investigating ancient DNA from all over Europe.



Dr. jur. Sophie-Marie Humbert

for the comprehensive analysis of current German law on surrogate motherhood and the proposal to regulate rather than prohibit surrogacy

Max Planck Institute for the Study of Crime, Security and Law, Feiburg i. Br.
Research field: Criminal Law/Legal Policy
Current activity: Legal Trainee at the Higher Regional Court Berlin

My topic of interest: How should surrogacy as a method of fertility treatment be assessed from an interdisciplinary perspective? Can the legalization of surrogacy in Germany adequately resolve the existing tensions?
My motivation: Societal change and developments in reproductive medicine raise complex questions for which the law must find answers. Surrogacy in particular breaks with traditional concepts of parenthood and family. Whether the law should allow new forms of family formation can, in my opinion, only be adequately assessed from an interdisciplinary perspective and with significant consideration of empiricism and moral philosophy. In this context, my work presents an interdisciplinary, alternative legal approach to surrogacy in Germany.
My next professional station: I am currently completing my legal clerkship at the Higher Regional Court of Berlin. I have not yet decided which career path I will take afterwards. I am, however, considering continuing to work in the academic field.

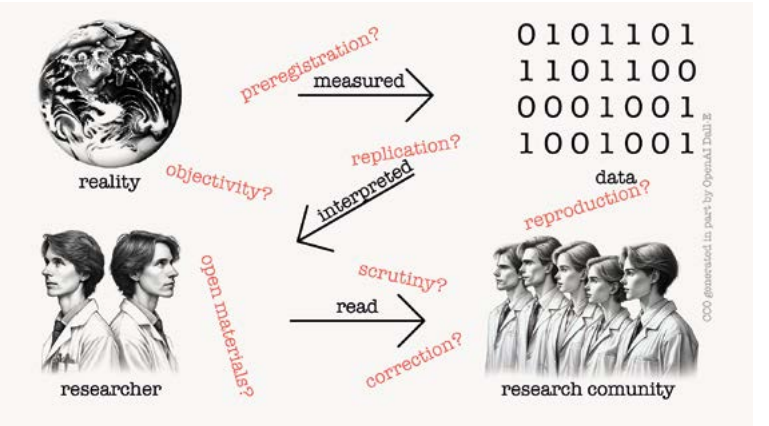
Dr. rer. nat. Aaron Peikert

for the formal derivation and practical implementation of criteria of transparency and reproducibility to increase the trustworthiness of findings in the social and behavioral sciences

Max Planck Institute for Human Development
Center for Lifespan Psychology, Berlin
Research field: Psychology
Current activity: Principle Investigator at the Max Planck Institute for Human Development

My topic of interest: Empirical sciences rely heavily on data to formulate and test theories. My research aims to identify the conditions under which these data intensive processes are effective and to find practical strategies that promote these conditions.
My motivation: I find joy in the progress of science, so investigating research methodology theoretically first and then to be able to participate actively in the labor of research, is a very rewarding.
My next professional station: I am now principal investigator of the research group in which I did my PhD and am exceedingly happy to be able to surround myself with people who are driven to improve research methods.

Human Sciences Section

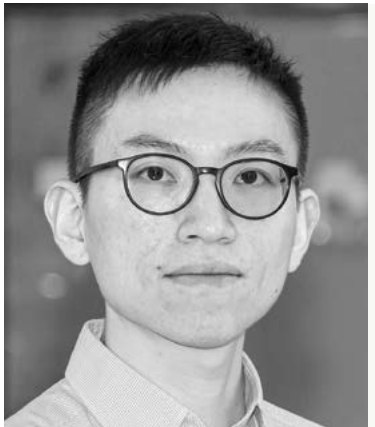


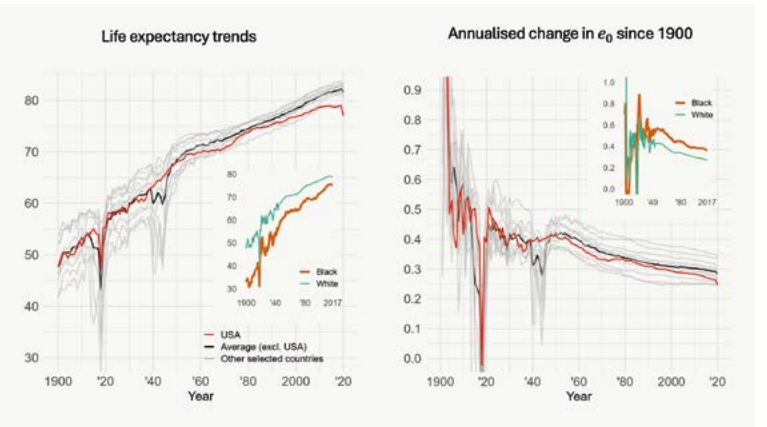
Jiaxin Shi, DPhil

convincingly demonstrated that traditional methods of measuring mortality inequalities are biased. The overreliance of outcomes in survival and retirement behaviour overlooks substantial heterogeneity in both, with implications for pension inequalities.

Max Planck Institute for Demographic Research, Rostock
Research field: Demography, Sociology
Current activity: Postdoctoral Researcher at the University of Wisconsin-Madison, USA

My topic of interest: IMy research seeks to understand the interrelationships between social stratification processes and population dynamics, in particular, population health.
My motivation: As a social scientist, I find it fascinating that my research contributes to a deeper understanding of how human societies function. Another motivating factor behind my research on social stratification and health is the potential policy impact and its contribution to overall well-being.
My next professional station: I am currently a postdoctoral researcher at the University of Wisconsin-Madison, where I focus my research on how early-life factors explain variations in old-age mortality.





Dr. rer. nat. Anna Isabel Thoma

for investigations on how environmental, cognitive, and methodological factors influence probability learning and repeated choice behaviour in children

Max Planck Institute for Human Development
Center for Lifespan Psychology, Berlin
Research field: Cognitive psychology, Developmental psychology
Current activity: Postdoctoral Fellow at the Max Planck Institute for Human Development

My topic of interest: How do children grow into ecologically rational decision makers? How does the interplay between the mind and the environment affect the development of decision making abilities across the life course?
My motivation: Children do not simply resemble naïve adults in their decision making. Instead, the interaction between the developing mind and growing experience with the world facilitates unique learning and exploration capacities. I am curious to uncover the cognitive and environmental factors that shape the development of decision-making abilities and that help us make adaptive decisions already early in life.
My next professional station: As a postdoctoral fellow at the Max Planck Institute for Human Development I further develop my research programme on the intersection between cognitive and developmental psychology.

Dr. rer. med. Rachel Gail Zsido

for the pioneering studies dedicated to the role of ovarian hormones on brain structure, function, and chemistry throughout the female lifespan

Max Planck Institute for Human Cognitive and Brain Sciences Department of Neurology, Leipzig

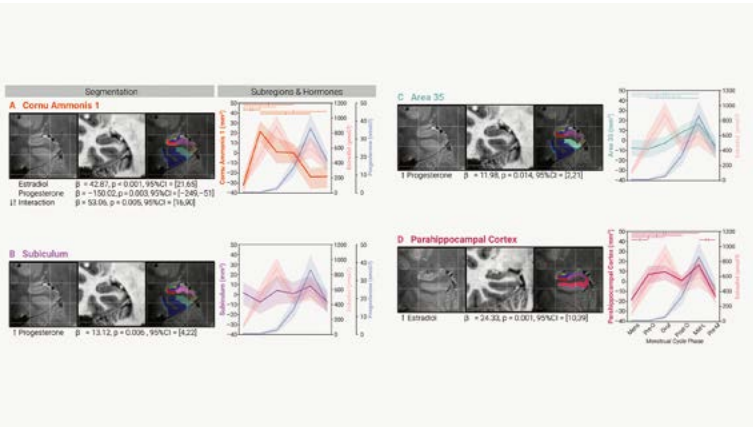
Research field: Cognitive Neuroscience

Current activity: Postdoctoral Fellow at the Harvard Medical School, Massachusetts General Hospital, USA

My topic of interest: How do reproductive aging and sex hormones shape brain structure, function, and chemistry across the lifespan, and can this help us better understand risk for depression and dementia?

My motivation: Faced with a rapidly aging population and current lack of preventative therapeutic options, it is essential that we develop strategies to support healthy cognitive aging throughout life. Critically, two-thirds of people living with Alzheimer's disease (AD) are women, unaccounted for by longevity alone and with accelerated risk during the menopause transition. Further, major depressive disorder (MDD) is an independent risk factor for AD and twice as common in women, a sex difference that emerges in early adulthood. As AD pathology emerges decades prior to clinical symptoms later in life, understanding shared pathophysiology and sex differences in AD and MDD (in the context of reproductive aging) may provide important clues for early identification and prevention of AD.

My next professional station: During my postdoc at Harvard Medical School and Massachusetts General Hospital, I hope to uncover how prenatal immune programming, sex hormones, and brain stress circuitry interact to contribute to the shared pathophysiology underlying three chronic diseases: MDD, cardiovascular disease, and AD.



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

Otto Hahn Award

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

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.

Dr. rer nat.
Ida Marie
Astad Jentoft

Biology
& Medicine
Section
see page 9

Dr. rer nat.
Laura
Olivera-Nieto

Chemistry,
Physics
& Technology
Section
see page 23

Dr. jur.
Sophie-Marie
Humbert

Human Sciences
Section
see page 32


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.

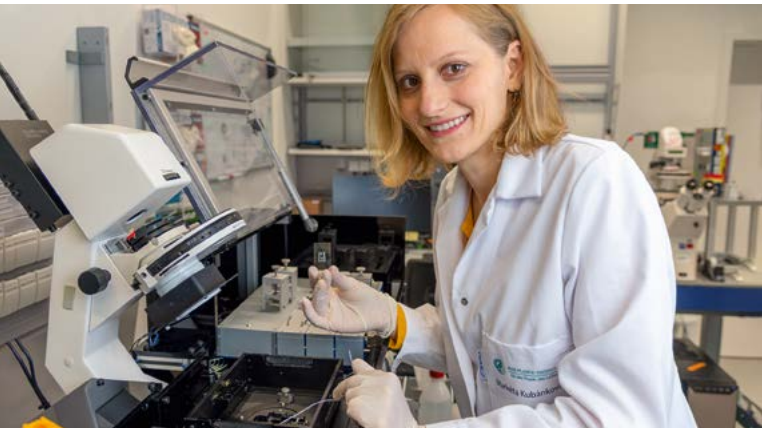
The prize recognizes outstanding postdoctoral achievements with reference to applied research, particularly in the Biology & Medicine Section and the Chemistry, Physics & Technology Section.
In accordance with the benefactor’s last will, the prize money enables the winners to further advance their research’s potential for application.

Markéta Icha Kubánková, PhD

for her excellent achievements at the interface between basic research and practical application, particularly regarding the development of novel diagnostics based on deformability cytometry

Max Planck Institute for the Science of Light, Erlangen
Research field: Cell biophysics
Current activity: Postdoctoral fellow at the Max Planck Institute for the Science of Light

My topic of interest: I want to know whether and how the physical properties of cells in human blood or tissues – and especially their mechanical properties – change during disease, and how such changes of cells can be exploited for diagnostic purposes.
My motivation: I hope that my research will have real impact on healthcare. That eventually, the outcomes of my research will lead to solutions that will improve or even replace current diagnostic approaches, positively affecting the lives of patients around the world.
My next professional station: I am just coming back from maternity leave and really looking forward to jumping back into my exciting projects at the Max Planck Institute for the Science of Light.

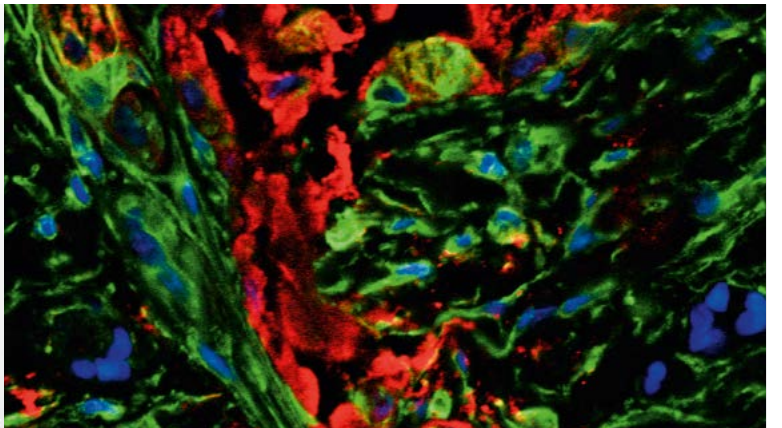


Oren Moscovitz, PhD

for his excellent achievements at the interface between basic research and practical application, particularly regarding the development of antibodies against various tumor-associated antigens in different cancers

Max Planck Institute of Colloids and Interfaces, Potsdam
Research field: Glycobiology
Current activity: Group Leader ›Glycan-Targeted Therapeutics‹ at the Max Planck Institute of Colloids and Interfaces

My topic of interest: Can we effectively utilize sugar molecules on cancer cells that distinguish them from their healthy counterparts to develop novel tools for cancer detection, patient stratification, and targeted therapy?
My motivation: My motivation, and the reason we focus on translational glycobiology, is the urgent need to develop additional tools to increase our too-thin toolbox in the global fight against cancer.
My next professional station: I plan to return to Israel next year to continue my research at the Scojen Institute for Synthetic Biology at Reichman University.



Dieter Rampacher Prize

As a motivation for students to complete a Ph.D. when young, the Dieter Rampacher Prize has been awarded to the youngest researcher within the Max Planck Society to complete a Ph.D. in each respective year since 1985. This year, two candidates of the same age were nominated and awarded accordingly. 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.

Dr. rer. nat.
Aaron Peikert

Human Sciences
Section
see page 33

Minerva Fast Track

The Minerva Fast Track Programme focuses on outstanding young female scientists.

Minerva, Roman goddess of wisdom and guardian of knowledge, symbolically stands for this ambitious and already extremely promising programme. The programme was launched in the Chemistry, Physics and Technology Section in 2014, the Human Sciences, Social Sciences and Humanities Section followed in 2017, and with the Biology and Medicine Section joining in 2023, it has now been established for all Sections of the Max Planck Society.

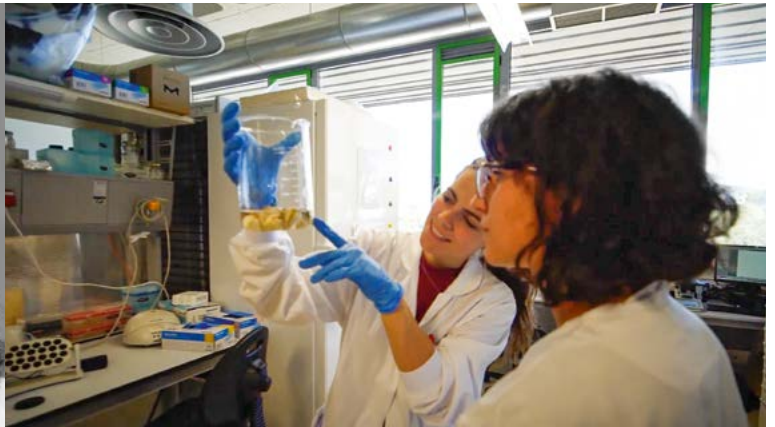
In late summer of each year, a call for nominations is issued for these positions. After successfully completing a dissertation or first postdoc, candidates have the opportunity to receive funding for a maximum of three years with the aim of subsequently applying for an open topic Max Planck Research Group or to start a scientific career elsewhere.

Dr. Alicia Bruzos

receives the Minerva Fast Track Fellowship to pursue her research on transmissible cancers in bivalves.

Max Planck Institute for Marine Microbiology, Bremen
Research field: Marine contagious cancer
Current activity: Postdoctoral researcher (Marie Skłodowska-Curie fellow) at the University Caen Normandy (Université de Caen Normandie), FRANCE

My topic of interest: Marine contagious cancer is a unique natural model in which a cancer has acquired the ability to spread from one individual to another. I would like to understand how a cancer cell can ›travel‹ that far which could provide valuable insights into cancer, as there are clear parallels between cancer contagion and cancer metastasis: a journey on a different scale but potentially sharing similar molecular mechanisms.
My motivation: My field of expertise is cancer genomics with a comprehensive understanding of 'mobile entities' such as retrotransposons, viral DNA integrations, or contagious cancer cells. I have hands-on experience in fieldwork, cellular/molecular wet lab, and bioinformatic analyses while my research bridges cancer biology, evolution, and marine ecology. Therefore, my motivation is to apply all my experience to contribute to the understanding of marine contagious cancers, benefiting marine life and human health.
My next professional station: In some months, I will launch my own Minerva Fast Track research group ›Marine Contagious Cancer‹ at the MPI-MM in Bremen. The research will focus on gaining mechanistic insights into the molecular, cellular, and ecological processes involved in the evolution of bivalve transmissible cancers while supervising two doctoral students.

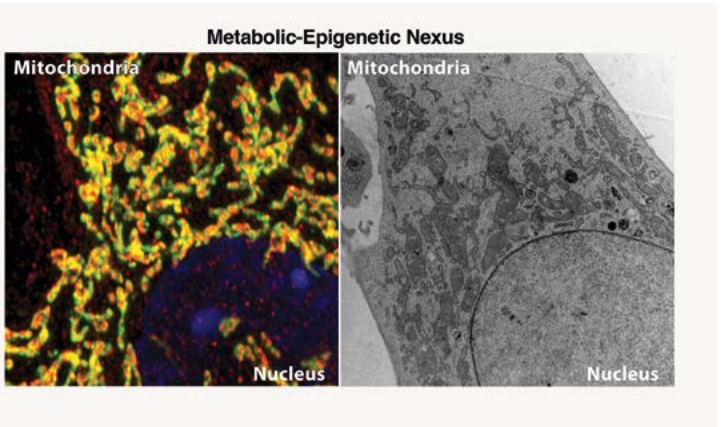


Dr. rer. nat. Sukanya Guhathakurta

receives the Minerva Fast Track Fellowship to focus on mapping factors at the intersection of epigenetic and metabolic regulation.

Max Planck Institute of Immunobiology and Epigenetics, Freiburg i. B.
Research field: Metabolism & Epigenetics
Current activity: Postdoctoral Fellow at the Max Planck Institute of Immunobiology and Epigenetics

My topic of interest: My research will focus on investigating the crosstalk between metabolism and epigenetics during human development, with the goal of uncovering the underlying pathomechanisms of neurological disorders.
My motivation: My interest in understanding human development is long standing and I find it incredibly fascinating how environmental cues play a pivotal role in organogenesis. Metabolism and epigenetics are key factors in cell fate decisions and their coordination is crucial for organismal health. I am driven to leverage foundational principles in biology to tackle complex diseases arising due to epigenetic and metabolic imbalances. Positioned at the forefront of cutting-edge scientific developments, I am motivated to address emerging health challenges and underscore the significance of basic research in facilitating medical advancements. I firmly believe that pioneering discoveries, regardless of the scale, not only offer intellectual gratification but also inspire future generations of scientists. The relentless pursuit of novelty and support from my mentors and colleagues propel me forward.
My next professional station: I will be hosted by department of Prof. Dr. Asifa Akhtar at the Max Planck Institute of Immunobiology and Epigenetics for the next years as a Minerva Fast Track group leader to carry out my independent research.

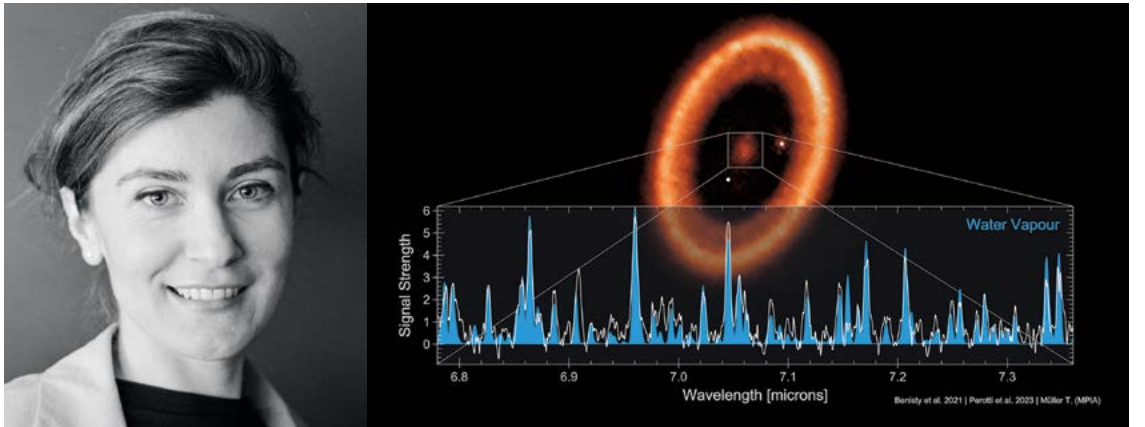


Dr. Giulia Perotti

receives the Minerva Fast Track Fellowship for conducting interdisciplinary research in the fields of astronomy and chemistry to study the building blocks of planetary systems.

Max Planck Institute for Astronomy, Heidelberg
Research field: Planet and Star Formation
Current activity: Postdoctoral Fellow at the Max Planck Institute for Astronomy

My topic of interest: Astronomers have long pondered how Earth became water-rich, with oceans, glaciers and rain that pours from the sky. Yet the details of water's cosmic journey to habitable planets — essential for understanding life's prevalence in the universe — remain largely unknown. My research aims at unravelling how water reaches rocky planets like our own.
My motivation: The wealth of data from new astronomical observatories is providing groundbreaking insights into the journey of water from star-forming molecular clouds to protoplanetary disks and planets, with water vapour being detected in nascent planetary systems. Discerning whether Earth's watery nature is unique or typical, fuels my curiosity profoundly.
My next professional station: Thanks to this Minerva Fast Track Fellowship, I will establish a group at the Max Planck Institute for Astronomy in Heidelberg from October 2024. My group will be using cutting-edge telescopes (JWST, ALMA) to observe planet-forming disks and track down the origin of water on Earth-like planets.



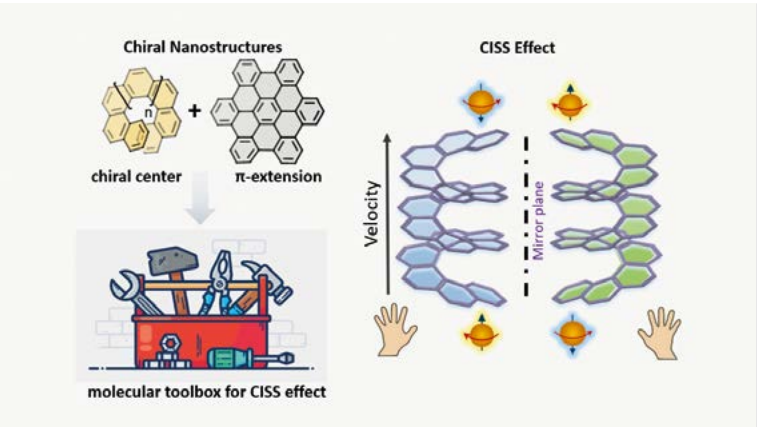
Wenhui Niu, PhD

receives the Minerva Fast Track Fellowship for her studies about the chiral carbon nanostructures and their potential applications in spin-controlled chemistry and spin-related electronic devices.

Max Planck Institute of Microstructure Physics, Halle a.d. Saale
Research field: Chemistry
Current activity: Minerva Fast Track Group Leader in Max Planck Institute of Microstructure Physics

My topic of interest: I am interested in studying chiral nanocarbons with exquisite structures and exotic optoelectronic properties, especially their spin-selective transport behavior.
My motivation: I am always deeply fascinated how exquisite organic molecules are. I have the strong curiosity to find out the huge potential of organic materials in next-generation electronics.
My next professional station : I am currently a Minerva Fast Track fellow in Max Planck Institute of Microstructure Physics. In this position, I will try to understand how the chiral organic nanostructures serve in charge transport and if they are able to be used in spin-related electronics devices.

Chemistry, Physics & Technology Section



Reena Debray, PhD

receives the Minerva Fast Track Fellowship for her studies of how social behaviour impacts the gut microbiomes of wild primates.

Max Planck Institute for Evolutionary Anthropology, Leipzig
Research field: Evolutionary Biology
Current activity: Minerva Fast Track Group Leader at the Max Planck Institute for Evolutionary Anthropology, Leipzig

My topic of interest: How do animals acquire their gut microbiomes, and how do they evolve over a lifetime?
My motivation: I am fascinated by how simple evolutionary processes such as mutation and natural selection have produced the diversity and complexity of the life we see around us.
My next professional station: After my current position, I plan to continue building my research group.

Katharina Isabel Schmidt, PhD

receives the Minerva Fast Track Fellowship for her studies on law's relationship with life.

Max Planck Institute for Comparative and International Private Law, Hamburg
Research field: Legal History & History of Science
Current activity: Senior Research Fellow at the Max Planck Institute for Comparative and International Private Law

My topic of interest: I have always been curious about law's liminal status between academic discipline and social practice. Telling stories about how knowledge and normativity relate to one another at different times and in different places affords me privileged access into people's minds and histories.
My motivation: ›To see a World in a Grain of Sand…‹ (William Blake)
My next professional station: I will soon begin my tenure as Minerva Fast Track fellow at the Max Planck Institute for Comparative and International Private Law in Hamburg. In this capacity I will explore humanistic perspectives on law's relationship with artificial intelligence.

Human Sciences Section

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 postdoctoral fellows with a unique insight into the research activities of the Nobel Laureates.

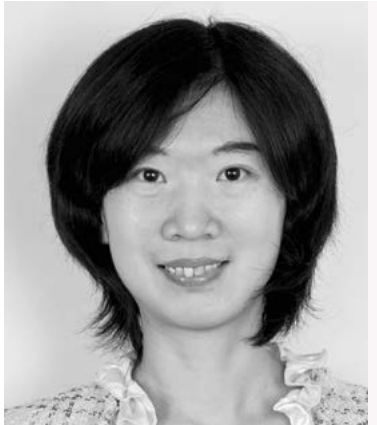
They also benefit from excellent national and international networks for their future career.

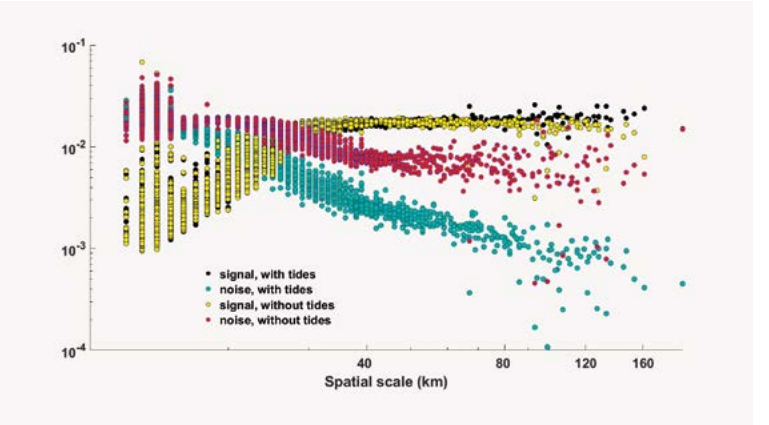
Dr. rer. nat. Lin Lin

Nobel Laureate:
Prof. Dr. Klaus Hasselmann

Ocean University of China;
Helmholtz-Zentrum Hereon
Research field: Physical Oceanology
Current activity: Postdoctoral Fellow at Max Planck Institute for Meteorology, Hamburg

My topic of interest: In my research, I aim to investigate the climate prediction ability of different model resolutions with the Max Planck Institute Earth System Model. Furthermore, I will explore the mechanism behind it from the Stochastic Climate Model, following the tradition of Klaus Hasselmann.
My motivation: Internal climate variability arises spontaneously through processes and feedback within the climate system and is therefore part of natural variability. Such understanding would be particularly crucial as it clarifies the sensitivity of the climate model to external forcing and fluctuations, further improving the understanding of climate model prediction ability.
My next professional station: I recently joined the Max Planck Institute for Meteorology as a postdoctoral researcher, where I will continue my exploration of how short-term fluctuation is integrated into low-frequency variability in the climate system.





Dr. rer. nat. Guillaume Bourdarot

Nobel Laureate:
Prof. Dr. Reinhard Genzel

Max Planck Institute for extraterrestrial Physics, Garching
Research field: Astrophysics
Current activity: Postdoctoral Fellow at the Max Planck Institute for extraterrestrial Physics

My topic of interest: Experiments for observing the Universe at the highest resolution. How do planets form and evolve, what are their properties?
My motivation: My aim is the development and science exploration of novel astronomical instruments. Recent progress in ground-based instrumentation and photonics have revolutionized observational astronomy. In my research, I am focusing in particular on infrared interferometry – a technique which combines the light from distant telescopes to arrive at hundred times higher resolution – to study a variety of objects, such as exoplanets, supermassive black-holes or newborn Suns analog to our own.
My next professional station: With this fellowship at the Max Planck Institute for extraterrestrial Physics, I will bring the GRAVITY+ instrument to the ESO's Paranal Observatory in the desert of Atacama, which will open up a new observational window in astronomy.

Chemistry, Physics & Technology Section

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