SCIENTIFIC LEADERSHIP
Board of Trustees Appoints Dr. Asifa Akhtar as Chair

MAX PLANCK FLORIDA RESPONDS TO CORONAVIRUS CRISIS

RESEARCH HIGHLIGHTS
MPFI Adds Two New Research Groups

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Letter from the CEO

Dear Friends of MPFI,

One of the most notable discoveries of 2020 was just how incredibly resilient the human spirit can be when faced with unprecedented challenges. As we leave this year and set our eyes to the future I can’t help but be proud of my colleagues at Max Planck Florida, who rose to every obstacle presented to them.

Our crisis management team acted swiftly to enact policies that kept our researchers safe while allowing our science to continue. Our machine shop changed course to produce protective gear for first responders during the shortages at the beginning of this crisis. Our education team found ways to continue valuable scientific training, benefiting young scientists in all stages of their career. I am grateful that we have these dedicated people as part of our MPFI family.

But these accomplishments are just part of Max Planck Florida’s 2020 story. Despite the upheaval of 2020, MPFI scientists saw their research published 17 times, with the most recent one being a major publication in the journal Nature. Our institute was awarded over $15K in grant funding and won awards in recognition of our scientific excellence and innovation. We even managed to grow - expanding the number of labs to ten with the addition of Research Group Leaders Dr. Sarah Stern and Dr. Salil Bidaye.

Great discoveries do not happen in isolation, and our success was not ours alone. Friends of Max Planck Florida, such as our Board of Trustees, supporters, government officials, and community partners all played a critical role in making our institute thrive. Please know how grateful we are for your support.

The life-changing damage caused by COVID-19 made it clear this year: science matters. Pursuing novel questions to find the answers that move humanity forward is more important than ever. We are proud to be part of a global network of curiosity-driven researchers, and we are encouraged by the creativity and talent of our scientific trainees. As we look to the future, I am confident and excited about the institute’s contribution to scientific knowledge and to the next generation of exceptional scientists.

With gratitude,

David Fitzpatrick, CEO and Scientific Director
Max Planck Florida responds to coronavirus crisis

Max Planck Florida Institute for Neuroscience (MPFI) put the machine shop’s state-of-the-art equipment to work manufacturing face shields for Palm Beach County first responders.

You’d normally find Markus Klement manufacturing highly technical custom parts for top scientific organizations across the globe, but his latest project made an important impact right here in Palm Beach County. He worked to get critical protective equipment to those fighting the coronavirus. Klement, a master mechanical engineer, and machinist, manages the Mechanical Workshop at MPFI. He wanted to help with the ongoing coronavirus crisis so he put the machine shop’s state-of-the-art equipment to work manufacturing face shields for first responders. As a result, MPFI was able to donate more than 170 shields to Palm Beach County Fire Rescue.

“Seeing what is happening in our community as coronavirus cases keep growing feels overwhelming, but it feels good that MPFI is doing something for the community, especially first responders, since they are working very hard and put their lives at risk,” Klement said.

Helping him in this endeavor was recent Dwyer High School graduate Samuel Haury Parra who worked to assemble the finished parts of the shields and prepare them for distribution.

“In the machine shop, we are always looking for ways to make things better, but with the coronavirus, there isn’t much we can do to solve that situation. Finding a way to use our skills to help first responders was a really great experience and it felt good to be able to do something to make a difference,” Haury Parra said.

Klement says the most difficult part of the process was sourcing the materials needed to make the shields since there is a shortage of the raw materials needed, such as elastic latex fabric for the headband and adhesive-backed polyurethane foam for the cushion.

Fellow MPFI mechanical engineer Nicole Holstrom spent hours sourcing the materials to make the masks. Holstrom said, “Everyone in the machine shop is eager to help the cause and will make more shields as more materials become available.”

The MPFI Mechanical Workshop is known globally for its excellence in designing and building highly specialized, commercially unavailable equipment and also customizing existing tools that allow MPFI scientists to develop non-conventional and unique...
Max Planck Florida Launches “Simplified Science” Project

There is no doubt that Max Planck Florida’s cutting-edge research is important. After all, brain diseases and neurological disorders affects millions of people globally. But the exact nuances of the science, along with the tools and techniques used to perform research can be a little hard to understand for a general audience. To combat that, Max Planck Florida launched Simplified Science in May of 2020, adding a page of resources for readers to connect with the science, techniques and people who push discovery forward.

Understanding science is more important than ever. Simplified Science helps by adding descriptions and articles that are accessible to a reader with no scientific training. In addition, stories about Max Planck scientists help the reader relate to the “people behind the bench” and learn from their journeys, backgrounds and experiences working in fundamental research.

But the project has another layer that benefits early career researchers. Learning how to succinctly and clearly explain science is an important skill, so the Max Planck Florida communications team works with post baccalaureate students to train them in effective communication skills. Adding this skillset to their repertoire of experience makes them more well-rounded and provides important exposure to other science-related career paths, such as outreach and communications.

“Max Planck Florida is truly redefining the future of neuroscience, and as we do this it is important to share our work with as many communities as possible. From policy-makers to young students considering a career in science, accessibility is the key to bringing science literacy and appreciation to a wider audience,” said MPFI’s Head of Public Communications Katie Edwards.

To learn more about Max Planck Florida’s Simplified Science project, please visit mpfi.org and select “Simplified Science” from the “Science” menu.
Dr. Salil Bidaye
Research Group Leader of the Neuronal Control of Locomotion Lab at MPFI

Dr. Sarah Stern
Research Group Leader of the Integrative Neural Circuits and Behavior Lab at MPFI
Max Planck Florida Adds Two New Research Groups

MPFI announces the addition of two new research groups. Led by Drs. Sarah Stern and Salil Bidaye, these new laboratories will expand Max Planck Florida’s areas of study to include studies on the neuroscience behind feeding habits (Stern) and motor control (Bidaye).

Dr. Stern began her Research Group Leader position at the Max Planck Florida Institute for Neuroscience in January 2021, leading the Integrative Neural Circuits and Behavior research group. Her research will focus on understanding how learning integrates with innate behaviors to produce diverse behavioral outcomes, from a molecular to the circuit level.

Prior to this, Dr. Stern was a Postdoctoral Fellow at Rockefeller University in the laboratory of Dr. Jeffrey Friedman, where she used her expertise in memory and rodent behavior to study the neural basis for environmental cue-driven over consumption. Although this has direct implications for obesity, which is a huge health problem, it is also a general model for how learning can influence innate behaviors leading to maladaptive choices. Dr. Stern also led a project studying the intersection of stress and feeding relevant to Anorexia Nervosa.

Dr. Stern earned her PhD in 2014 from the Icahn School of Medicine at Mount Sinai in the laboratory of Dr. Cristina Alberini, where she studied the role of Insulin and IGF-II on memory consolidation and enhancement, as well as the role of astrocytic lactate signaling on long-term memory formation and consolidation. Prior to that Dr. Stern conducted research with Dr. Joseph LeDoux as an undergraduate student at New York University, where she graduated magna cum laude, with honors.

Dr. Stern is the recipient of numerous honors including a K99/R00 Pathway to Independence Award and a NARSAD Young Investigator Award.

Prior to this Dr. Bidaye was a Postdoctoral Fellow at the University of California – Berkeley in the lab of Professor Kristin Scott. Before that, he earned his Ph.D. at the Research Institute of Molecular Pathology (IMP), Vienna in Dr. Barry Dickson’s laboratory. Over the course of his doctoral and postdoctoral work, Dr. Bidaye has established an independent research program centered around understanding motor control using Drosophila walking as a model system. While a Ph.D. student, Bidaye discovered the neurons that constitute the central pathway for backward directed walking in fruit-flies, dubbed the “moonwalker neurons”. This work has spurred several studies aimed at understanding how animals instantaneously switch their walking directions in response to sensory stimuli. During his postdoctoral work, Bidaye used Drosophila genetics tools to address another fundamental question pertaining to locomotor control: how do animals initiate walking? This led to the identification of two distinct brain pathways that initiate distinct forward walking programs. Functional characterization of these neurons uncovered how contextual information impinges on sensory-motor circuits to achieve task-specific walking control. This work not only characterizes the central nodes in the walking circuit of the fly but also provides genetic tools to begin unraveling the downstream circuits essential for executing an optimal walking pattern.

To learn more about the areas of focus of all of Max Planck Florida’s research groups, please visit https://mpfi.org/science/our-labs/.
Max Planck Florida Showcases Programs at SfN Virtual Graduate School and Career Fair

MPFI hosted a virtual booth at the Society for Neuroscience (SfN) Virtual Graduate School and Career Fair from November 05-07, 2020.

The SfN Virtual Graduate School Fair provided prospective students, advisers and neuroscience graduate program representatives with a unique opportunity to connect, learn and engage with graduate programs from around the world one-on-one through live text and video chat from the comfort and safety of their own homes.

The MPFI virtual booth was visited by around 100 potential students to hear about the MPFI graduate program opportunities. The International Max Planck Research School (IMPRS) for Brain and Behavior is the first of its kind in uniting universities and Max Planck Institutions on both sides of the Atlantic, and it offers a competitive world-class Ph.D. training and research program. Our research programs address how sensory information is encoded in neural circuits and is transformed ultimately to behavior. The level of analysis ranges from understanding molecular signaling cascades in spines during learning to understanding how sensory and motor circuits are activated in awake behaving animals. Learn more at mpfi.org/graduate-programs/ or email imprs@mpfi.org.

From January 11-13, 2021, SfN is holding another graduate school and career fair at SfN Global Connectome: A Virtual Event. MPFI presence is confirmed at this fair to keep promoting our graduate programs and attract potential new students.
MPFI virtual booth at the SfN Graduate School and Career Fair
MPFI Researchers Sweep SfN Gruber Awards

Each year, a committee of neuroscientists from the Society of the Neuroscience convene to evaluate applications for The Peter and Patricia Gruber International Research Award in Neuroscience, an annual award that recognizes early career neuroscientists who not only demonstrate scientific excellence, but also a commitment to international collaboration.

Only two winners are selected from a pool of talented scientists from around the world and this year, both winners come from the Max Planck Florida Institute for Neuroscience. MPFI Research Group Leaders Dr. Vidhya Rangaraju and Dr. Hidehiko Inagaki are the 2020 winners of the Peter and Patricia Gruber International Research Award in Neuroscience. Winners of this prestigious prize receive $25,000 and special recognition from the president of SfN at the organization’s annual international meeting.

MPFI welcomed Rangaraju as Research Group Leader in January 2020. The Rangaraju group studies the energy use and supply of biological processes in neurons. Prior to this appointment, Rangaraju was an EMBO and Marie Curie Postdoctoral Fellow in the group of Dr. Erin Schuman at the Max Planck Institute for Brain Research in Germany. During her postdoc, she uncovered the presence of local mitochondrial compartments of energy that fuel local translation during synaptic plasticity. She completed her Ph.D. in the lab of Dr. Timothy Ryan at Weill Cornell Medicine in New York. During her graduate work, she developed a novel optical reporter of the energy-carrying molecules and elucidated the link between the activity of neurons and the synthesis of these molecules.

She is the recipient of numerous awards including the Vincent DuVigneaud Award of Excellence, The Lindau Nobel Laureate Meeting Award, and the MPIBR Scientific Discovery of the Year Award.

Inagaki started his Research Group Leader position at MPFI in September 2019 leading the Neural Dynamics and Cognitive Functions research group.

Inagaki’s research focuses on understanding cellular and network mechanisms underlying cognitive functions in mice, such as decision making and time perception. He was the winner of the Max Planck Society Free Floater Competition. The competition invites leading postdoctoral fellows to apply for the opportunity to become a research group leader at a Max Planck Institute. As the winner, Inagaki could choose which of the Max Planck Institutes that are studying the brain he wanted to work in. Inagaki chose MPFI for its research focus on neural circuits and its highly interactive and collaborative environment.

Prior to this appointment, Inagaki was a Postdoctoral Fellow at the Janelia Research Campus of Howard Hughes Medical Institute, working with Dr. Karel Svoboda. At Janelia, he studied the neuronal mechanism of short-term memory in frontal cortex. Inagaki completed his Ph.D. under the mentorship of Dr. David J. Anderson at the California Institute of Technology. For his graduate work, he studied the neuronal mechanism of internal states in Drosophila.

He is the recipient of numerous honors including Harold M. Weintraub Graduate Student Award, Larry Katz Memorial Lecture Award, and the Searle Scholar.
Board of Trustees Appoints Dr. Asifa Akhtar as Chair

Akhtar is the first international female vice president of the Max Planck Society’s Biomedical Section.

The Board of Trustees bid farewell to Dr. Bill Hansson who is stepping down from his role as Vice President of the Max Planck Society Biomedical Section, and chairman of MPFI’s board of trustees. Dr. Hansson became chairman of MPFI in June of 2014, and saw the institute through a period of exceptional growth and scientific success. He is succeeded by Dr. Asifa Akhtar who was appointed as Vice President of the Biomedical Section in July of 2020. Dr. Akhtar joined MPFI board members at the November meeting, where she was officially named chair.

Asifa Akhtar is a Director of the Department of Chromatin Regulation at the Max Planck Institute of Immunobiology and Epigenetics. In July 2020, she became the first international and female vice president of the Max Planck Society’s Biology and Medicine Section, which oversees more than forty-five institutes with research that focuses on life sciences, including anthropology, biochemistry, neuroscience, and more.

Born in Karachi, Pakistan, Dr. Akhtar obtained her doctorate at the Imperial Cancer Research Fund in London, UK in 1997. She then moved to Germany, where she was a postdoctoral fellow at the European Molecular Biology Laboratory (EMBL) in Heidelberg and the Adolf-Butenandt-Institute in Munich from 1998 to 2001. She rejoined the EMBL Heidelberg as a group leader before becoming a Max Planck Investigator at the MPI in Freiburg in 2009. Since 2013, she has been a director at the MPI for Immunobiology and Epigenetics in Freiburg.

Asifa Akhtar was awarded the Early Career European Life Science Organization Award in 2008, EMBO membership in 2013, the Feldberg Prize in 2017, and the Leibniz Prize award in 2020, which is considered Germany’s most prestigious scientific award. She was elected as a member of the National Academy of Science Leopoldina in 2019.

“I am excited to work with the board of trustees at Max Planck Florida, which is an important part of the Max Planck Society’s international strategy. I look forward to being a part of the growth and excellent science that the institute is sure to bring in the coming years.”

Dr. Asifa Akhtar, Vice President of the Biomedical Section of the Max Planck Society, Scientific Director of the Max Planck Institute of Immunobiology and Epigenetics.
Dr. Jason Christie Receives Two NIH Awards

MPFI Research Group Leader Dr. Jason Christie received two significant grants from the National Institute of Neurological Disorders and Stroke of the NIH to support ongoing investigation of neural circuits in the cerebellum that instruct and guide motor learning.

The cerebellum, an anatomically unique region of the brain, plays a central role in fine motor control and motor learning. When functioning normally, the cerebellum is essential in learning and performing skilled movements, but its dysfunction has been linked to movement disorders such as ataxia (progressive loss of fine motor skills) and dystonia (uncontrollable muscle contractions). Motor learning occurs when mistakes are made while performing movements. Specialized cells in the cerebellum, called Purkinje cells, receive powerful instructive signals that guide our behavior and improve subsequent movements. What has remained largely unknown, is how these instructive signals are modulated to produce a spectrum of learning outcomes. Through his research, Christie has identified the importance of a key type of neuron, molecular layer interneurons, that may be essential in modulating error signals and driving adaptability of motor learning.

The first award, announced in April 2020 was for $2.6 million over five years. The proposal also received a perfect impact score. The goals of his project are to identify the locations in the cerebellum where motor memories are stored and to uncover the molecular and synaptic features that allow for a diversity of memories.

In July, the Christie lab received another grant for $3.3 million over five years. This grant is funded through the BRAIN Initiative Program (Targeted BRAIN Circuits Projects). The goal of this study is to characterize the diversity of inhibitory molecular layer interneuron subtypes and determine how their neural connections allows them to play a determinant role in error-driven motor learning, insight that is required to understand how the cerebellum operates in health and disease.

With the support of this crucial funding, Dr. Christie’s research will provide a better understanding of how neural circuits in the cerebellum ensure accurate movement, turning the motor errors we make into reliable, adaptable and meaningful learning; laying the foundational science that will lead to tomorrow’s cures.
Dr. Ryohei Yasuda Awarded $8.8 Million To Study Memory

MPFI Scientific Director Dr. Ryohei Yasuda has been awarded the prestigious Outstanding Investigator Research Program Award by the National Institute of Neurological Disorder and Stroke (NINDS) of the National Institutes of Health (NIH) and will receive $8.8 million in funding over the next eight years.

Yasuda received a perfect score on his application, a rare accomplishment among even the most experienced scientists. This award recognizes leaders in the field of neuroscience whose records of research achievement demonstrate their ability to make major contributions to neuroscience. This is the first time an MPFI researcher has received this award.

The Yasuda Lab focuses on Synaptic plasticity, the ability for synapses to change their connection strength, is thought to underlie learning and memory. Cascades of biochemical reactions in dendritic spines, tiny (~0.1 femtoliter) postsynaptic compartments emanating from dendritic surface, trigger diverse forms of synaptic plasticity. The lab aim to elucidate some of the operation principles of such signaling networks in dendritic spines using optical techniques.

Dr. Hidehiko Inagaki Awarded Searle Scholar Award

MPFI Research Group Leader Dr. Hidehiko Inagaki has been selected as a 2020 Searle Scholar, in recognition of his work on Neural Dynamics and Cognitive Function.

Inagaki has been selected as a 2020 Searle Scholar, in recognition of his work on Neural Dynamics and Cognitive Function. Dr. Inagaki was selected from 199 applicants and 139 institutions who applied for the award, which recognizes scientists who focus on high-risk / high-reward science. The $300,000 award supports exceptional young faculty who demonstrate innovation in research. Inagaki is one of only 15 researchers selected nationwide to receive the scholarship.

Inagaki started his Research Group Leader position at MPFI in September 2019 leading the Neural Dynamics and Cognitive Functions research group. His current research focus is to understand cellular and network mechanisms underlying cognitive functions, such as purposeful movement initiation and time perception, in mice. The ultimate goal of his lab is to understand how neuronal dynamics support diverse cognitive and motor functions.
2020 Awarded Grants and Fellowships

NATIONAL EYE INSTITUTE, NATIONAL INSTITUTE OF HEALTH
Benjamin Scholl
Title: Principles of presynaptic networks for single layer 2/3 neurons in ferret visual cortex
**TOTAL: $215,782**
02/01/2020-01/31/2022

NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE, NATIONAL INSTITUTE OF HEALTH
Jason Christie
Title: Motor Memory Storage in the Cerebellum
**TOTAL: $2,605,223**
04/15/2020-04/14/2025

NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE, NATIONAL INSTITUTE OF HEALTH
Ryohei Yasuda
Title: Neuronal Intracellular Signaling Underlying Synaptic, Circuit and Behavioral Plasticity
**TOTAL: $8,760,217**
05/01/2020-04/30/2025

SEARLE BIOMEDICAL SCHOLARS PROGRAM
Hidehiko Inagaki
Title: Neuronal Mechanisms to Time Actions
**TOTAL: $300,000**
07/01/2020-06/30/2023

NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE, NATIONAL INSTITUTE OF HEALTH
Jason Christie
Title: Organization of Inhibition in the Cerebellar Cortex
**TOTAL: $3,273,307**
08/01/2020-06/30/2025

SRYBNIK FOUNDATION
Ryohei Yasuda
Title: Uncovering the Role of Insulin-Like Peptides Signaling in Memory Formation
**TOTAL: $10,000**
11/01/2020-12/31/2020


**2020 Scientific Publications**

**ARTICLES**


**BOOK CHAPTER**


**YEAR IN REVIEW**

Molecular brake on learning: uncovering a potential therapeutic strategy to prevent memory loss

Researchers from MPFI uncover a surprising new role for the protein centaurin-α1 in regulating memory formation

No piece of music better highlights the lighthearted and spooky side of Halloween quite like J.S. Bach’s Toccata and Fugue in D minor. This iconic piece features the haunting melodies of the pipe organ; an instrument that projects grandeur in both sound and appearance. The intricate stop mechanism within the pipe organ is responsible for alterations in the overall sound character and volume. As the name suggests, stops block incoming air into an organ’s pipes, dramatically reducing how loud it can play. When all the stops are removed, an organ can play at its maximal volume; hence the popular saying “pulling out all the stops.”

When it comes to learning and memory, our brains share a very similar mechanism to the stops of a pipe organ. When we learn new skills or form memories, dynamic changes occur at sites of communication between neurons called synapses. Cascades of proteins are activated within, resulting in lasting alterations to synaptic strength. This process, known as synaptic plasticity, is thought to underlie how we learn and remember.

“Many of the proteins involved in synaptic plasticity, fall into the pro-plasticity category. These types of proteins are responsible for driving the intricate signaling forward, ultimately facilitating the process of learning and memory,” explains Dr. Ryohei Yasuda, Scientific Director at MPFI. “By contrast a much smaller subset of unique proteins seems to have the exact opposite effect, acting to attenuate and balance the feed-forward signaling.”

These unique proteins are more similar to a pipe organ’s stops, functioning as negative regulators of overall activity. Though it’s not yet fully understood why these proteins function in this way, studying them is crucially important for gaining a more complete understanding of the biological processes involved in learning and memory.

In a recently published study in eNeuro, the Yasuda Lab has identified a new negative regulator of synaptic plasticity called centaurin-α1 (CentA1). A highly abundant protein in the brain, CentA1 has been previously implicated in dendritic differentiation and as a potential mediator in Alzheimer’s disease. But up until now, the exact neurobiological functions of the protein haven’t been well studied.

In order to get a better picture of CentA1’s function within the brain, the team created a novel mouse line knocking out the protein. Comparing the brains of mice lacking CentA1 with their wildtype counterparts, they found the overall brain structure and morphology to be indistinguishable between the two. While this seemed to hold true for most
brain regions, a major difference was spotted within the hippocampus. In mice lacking CentA1, there was a noticeable increase in the amount of small synaptic compartments called dendritic spines across all age groups tested. Looking closer with electron microscopy, it was found that despite the increase in spines, the fine structure of these synaptic compartments remained the same. Because spine density is so closely associated with synaptic plasticity, this increase hinted at the possibility of CentA1 playing a major role.

To further explore this connection, MPFI scientists used two-photon glutamate uncaging and electrophysiology to assess both single-spine structural plasticity as well as functional plasticity within the CA1 region of the hippocampus. In mice lacking CentA1, they found a significant increase in both structural and functional plasticity compared to wildtype controls. To validate whether these changes to plasticity had functional consequences on behavior, mice lacking CentA1 were assessed in a variety of learning and memory tasks. Surprisingly, each behavioral result came up similar for both groups. One drawback to standard behavioral tasks, is that they aren’t very good at picking up improvements in learning. In collaboration with the Stackman Lab at Florida Atlantic University, a newly optimized and more challenging object-in-place memory task was implemented. With this hippocampus-demanding test, mice lacking CentA1 showed significant improvements in associative recognition memory and enhanced learning.

“Our results indicate that CentA1 seems to be a novel, negative regulator of both synaptic plasticity as well as hippocampus-dependent memory,” notes Dr. Erzsebet Szatmari, former Senior Scientist in the Yasuda Lab and currently an Assistant Professor at East Carolina University. “It seems that rather than causing structural alterations to the brain, CentA1 exhibits its unique function through downstream signaling. Given its strong association with memory attenuation and Alzheimer’s disease, CentA1 may represent a potential therapeutic target preventing memory decline in normal and pathological aging.”
New approach reveals structure and function of individual synapses

An interdisciplinary team of scientists at MPFI have developed a novel approach to measure the activity and strength of individual synapses that drive a neuron’s response to sensory input.

A common analogy used to describe the brain is that it consists of tiny interconnected computers. Each one of these computers, or neurons, process and relay activity from thousands of other neurons, forming complex networks that allow us to perceive our surroundings, make decisions, and guide our actions. Communication between neurons occurs through tiny connections called synapses, and each neuron integrates the activity across these synapses to form a single output signal. However, not all synapses are created equal. Synapses converging onto an individual neuron differ in size, and size is correlated with strength: larger synapses are stronger and have a greater influence on a neuron’s output than smaller synapses. But why are some synapses stronger than others, and how does this impact individual neurons processing incoming signals?

One well-known theory has suggested an answer. The Hebbian model for circuit development posits that the strength of a synapse between two neurons is determined by similarity in their activity. Synapses between neurons that are highly co-active become stronger than those that are less frequently co-active. This relationship provides a clear prediction for the diversity of synapse sizes present in mature neurons. Large synapses would be formed...
with other neurons that have very similar response properties, and these synapses have a dominant role in determining the output of the neuron. In contrast, small synapses would arise from neurons with less similar response properties and have less impact on the neuron’s response. Although there is some evidence in support of this model, a direct test requires measuring the activity of individual synapses, their size, and their neuron’s output signal, a combination that has been challenging to achieve with existing technologies.

Now, for the first time, an interdisciplinary team of scientists at MPFI report the results of a novel approach that allowed them to achieve these measurements. Published in the journal Nature, their work challenges predictions of the Hebbian model, demonstrating that synapse size is not correlated with response similarity and suggests neural response properties reflect the total number of active synapses, both weak and strong.

Benjamin Scholl, Ph.D., a postdoctoral researcher in the Fitzpatrick lab at MPFI, was inspired to explore this question in the visual cortex, where he could take advantage of the fact that individual neurons exhibit a high degree of selectivity in their response to different features in the visual scene, such as the orientation of edges or the direction of a moving object. This phenomenon, termed feature selectivity, arises through the integration of thousands of synapses conveying different signals, but exactly how this occurs is unknown. “We aimed to test the hypothesis that the strong synapses have responses that closely match the neuron’s feature selectivity, while the weak ones do not,” explained Scholl, who is co-first author of the study. To test this hypothesis, the scientists utilized a light microscopy technique to visualize the activity of a population of synapses on individual neurons in real time. But this technique alone has a severe limitation—only synaptic activity can be observed, not their strength.

To measure synapse strength, a collaboration was formed with another team of scientists from the Electron Microscopy Core Facility at MPFI, led by Naomi Kamasawa, Ph.D. “Electron microscopy captures incredibly detailed images of a synapse, at the nanometer scale, allowing us to make precise measurements of their structure”, explained Connon Thomas, co-first author of the work and an electron microscopy specialist. “These structural measurements tell us how strong each synapse is. By first examining synapse activity with light microscopy, then measuring the strength of those same exact synapses with electron microscopy, we knew we could answer this question”. The combination of these techniques, termed Correlated Light and Electron Microscopy (CLEM), allowed the researchers to measure the function (feature selectivity) and structure (strength) of populations of synapses from several neurons.

In their initial results, the team found nothing unexpected: some synapses shared feature selectivity with the neuron, while others were different; some synapses were small (weak), while others were large (strong). But when these data were put together, the authors were surprised to find that both strong and weak synapses exhibited a wide variety of functional properties: there was no strict relationship as theorized. However, by examining the activity of the whole synaptic population, the researchers recognized that they had uncovered the likely synaptic basis for feature selectivity. “We observed a ‘strength-in-numbers’ phenomenon. Our data suggest that the feature selectivity of a neuron is derived from the total number of synapses activated, including strong and weak,” described Scholl. “In fact, we found many more weak synapses driving feature selectivity, which suggests they could have a predominant influence”. In support of this, the team observed that neighboring weaker synapses were more often co-active, which could even enhance their influence on the neuron.

These results challenge the prevailing theory that strong synapses are exclusively found between neurons with similar response properties and play the dominant role in determining a neuron’s feature selectivity. Instead, selectivity appears to derive from the total numbers of synapses, suggesting that a synaptic democracy (akin to the popular vote) is most important. This still leaves open the question of why some synapses are stronger than others and studies are underway using these technologies to explore what other aspects of synaptic connections might be important. “Combining both structural and functional measurements of neurons provides a more holistic understanding of how our brains compute information” says Thomas. “The CLEM technique is allowing us to push the boundaries of what we know about fundamental workings of the brain.” This work emphasizes the creative synergy that results from bringing together curiosity-driven scientists from different disciplines, enabling new insights into neural circuit organization that could not have been anticipated, and laying the foundation for tomorrow’s advances in understanding disorders of brain function.
Early visual experience drives precise alignment of cortical networks critical for binocular vision

Researchers at MPFI identify three distinct cortical representations that develop independent of visual experience but undergo experience-dependent reshaping, an essential part of cortical network alignment and maturation.

Neural networks in the visual cortex of the brain do a remarkable job of transforming the patterns of light that fall onto the retina into the vivid sensory experience that we call sight. A critical element of this encoding process depends on neurons that respond selectively to different features in the visual scene. Edges and their orientation in space carry an enormous amount of information about the visual environment, and individual neurons in the visual cortex encode this information by responding selectively to a narrow range of edge orientations; some responding maximally to vertical or horizontal, and others to different orientations in between. But neurons in visual cortex face another challenge in representing visual information: They must bring together the signals that originate from the left and right eyes to create a single unified binocular representation. The association of the inputs from the two eyes occurs in the visual cortex and we know that this is achieved with a high degree of precision such that individual neurons respond selectively to the same orientation with stimulation of either the left or right eye. What has been missing is a clear understanding of the developmental mechanisms that are responsible for uniting the inputs from the two eyes, a gap in knowledge that led Max Planck Florida researchers to a series of experiments that have revealed a critical role for early visual experience in guiding the formation of a unified binocular representation.

The first issue that Max Planck scientists Jeremy Chang, David Whitney, and David Fitzpatrick wanted to address is whether alignment of the inputs from the two eyes requires visual experience. Does the brain use vision to align the representations? They approached this question in the ferret, a species that has a well-organized visual cortex with a repeating modular structure in which nearby neurons have similar orientation preferences, resulting in distinct patterns of activity across the cortical surface for different orientations. This makes it possible to use imaging techniques that detect calcium signals to visualize the different modular patterns of activity that are associated with different orientations. Prior to the onset of visual experience, they found that monocular stimulation produced activity patterns that had all the hallmarks of the mature visual cortex except one: the modular patterns of activity produced by stimulation of the left eye with a single orientation, were different from the modular patterns produced by the same stimulus orientation presented to the right eye. In other words, our brains are capable of developing orderly network representations of edge orientation in the absence of visual experience, but these networks lack the binocular alignment that is seen in mature animals. Additional experiments allowed the investigators to uncover a dynamic process that occurs over a short period of time (7-10 days) in which visual experience drives the alignment of these early representations. Importantly, the period when visual experience is capable of supporting alignment was found to be limited to the first week after eye opening, making it clear that early visual experience is critical for proper development of the circuits that support binocular vision for the rest of life.

These results suggested that binocular visual experience early in development is likely to be a key factor in the alignment of the network representations of the two eyes. This led them to wonder what the patterns of activity in visual cortex would look like for simultaneous stimulation of the two eyes early in development before alignment has been achieved. Surprisingly, they found that binocular stimulation
In the mature visual cortex, similar modular patterns of activity are observed when the same orientation is shown to the left or right eye. In contrast, early in development, markedly different patterns of activity are observed for the same stimulus, resulting in a monocular mismatch that reflects misalignment of the orientation representations from the two eyes.

Led to the appearance of a third modular representation—one that was distinct from the patterns of activity found for stimulation of the two eyes independently. By tracking these three representations across time they discovered that the early binocular representation was more stable than the others, appearing most similar to the mature, unified representation that emerges with visual experience. Thus, the activation of this binocular representation with the onset of binocular visual experience may guide the reorganization process, ensuring that all three representations become aligned as a single coherent network.

Ultimately, these changes in network structure must reflect changes in the response properties of single neurons, and to probe the process of alignment at the cellular scale, they turned to experiments using two-photon imaging that allowed them to visualize the response properties of individual neurons. Consistent with the network representation observations, individual neurons exhibited mismatched orientation preferences for monocular stimulation prior to the onset of visual experience that are rectified by changes in preferred orientation induced by visual experience. The next steps of this project are to investigate network reorganization at the synaptic scale, to identify precisely which components of the cortical network are changing and the mechanisms that enable the change.

A greater understanding of the mechanisms responsible for the experience-dependent alignment of cortical networks is critical for addressing visual disorders that arise from early abnormalities in visual experience such as amblyopia. But experience-guided alignment of cortical networks is likely critical for a broad range of brain functions—sensory, motor, and cognitive—that are optimized to support effective navigation and interaction with our world. Identifying those aspects of brain circuitry that depend on early experience for proper alignment, and understanding the underlying alignment mechanisms could offer insights into a host of neurodevelopmental disorders whose causes are still largely unknown.
If you follow Max Planck Florida on social media, you have no doubt seen a series of new videos that showcase the spirit of Max Planck Florida. This year’s employee spotlight features the person behind the camera who brings those stories to life. Kevin Albertini joined MPFI in 2018 and works in the Office of Scientific Communications.

How would you describe your job at MPFI?

My job at MPFI is a collaborative one by nature. I work as part of a small team where my role is to help the scientists and the institute in developing and producing visual & audio media that creatively amplifies both the science as well as the scientist. That often involves filmmaking and photography, as well as multimedia design and production.

What is your favorite project that you’ve worked on at MPFI and why?

I have two; the first project being the creation of our mini documentary that is currently part of the ‘Images of Science’ exhibit at the Frost Science Museum. This was my first collaborative project with many of the scientists and specialists at the institute. It really expanded my understanding of the science as well as my connection with the scientists here at Max Planck Florida. The second, was creating all the visual media for our engagement events at the 2019 SFN conference in Chicago. We all had a blast hosting an event that had a big turnout.

When you are not working, what do you like to do?

I tend to watch movies, play video games, hike trails with my dog, create music, shoot photography, write and shoot short films. I’m also getting married soon so needless to say, wedding planning has increasingly become “what I do” when I’m not at work.

What have you learned since coming to MPFI?

Admittedly, it took me a few weeks to be able to confidently say the word ‘microscopy’ when I started back in 2018. Since then I have learned and continue to be fascinated by how seemingly interconnected things appear to be within neuroscience and scientific research as a whole. Being in the communication department, I get to see a bit of a narrative arch starting with a scientist having a question and then collaborating with multiple specialists to create new tools and techniques in pursuit of the answers. It’s really inspiring to literally see how things are being discovered.
In 2020, MPFI Welcomed the Following Postdoctoral and Research Fellows:
Zhen Yang, Ilika Ghosh, Yonil Jung, and Mike Guest

Our new Graduate Students were:
Kori-Anne Citrin, Joseph Wasserman, Roberto Hernandez, and Cody Loomis

Our new Postbaccalaureate Research Fellows were:
Romy Aiken, Rory Cooley, Jacob LaMar, Micaiah McNabb, Kelly South, Eleanor Stuart, Isaac Wendler, and Zhongkai Wu,

New Undergraduates were:
Matthew Pacheco, Tejas Purimetla, and Vivek Sreejithkumar

New Research Technicians:
Shaun Foutch, Christopher Apgar, and Mina Dawod

We also Welcomed
Sean Coveleski
as Vice President and Chief Development Officer
Vidhya Rangaraju
as Research Group Leader
Sarah Stern
as Research Group Leader
Edward Chwieseni
as Head of Information Technology
Glen Linthicum
as Head of Facilities
Amanda Jorgensen
as Advancement Specialist for Major Gifts and Research
Colleen Neiner
as Animal Care Technician
Kaitlyn Letourneau
as Student Employee
Diana Legutko
as Visiting Student
Christopher Cannon
as Electrical and HVAC Service Specialist
Irena Suponitsky-Kroyter
as Research Assistant
Lantz Pierre
as Security Manager
Lucas Haury Parra
as Institutional Assistant

2020 New Team Members

MPFI has appointed Dr. Joseph W. Schumacher as head of undergraduate training.

In this role, Schumacher will work closely with our partner programs at FAU, including the Max Planck Honors program and FAU Jupiter High School. Joe has been at MPFI for six years, working as a postdoctoral research fellow in the lab of Dr. David Fitzpatrick. During his time at MPFI he has actively engaged in community outreach efforts and shared his science through public lectures and teaching. Joe is one of the founders and hosts of MPFI’s Neuromissions podcast, a science communication project that shares stories from the world’s leading neuroscientists in an accessible and engaging way. He graduated from Columbia University with a Ph.D. in Neurobiology and Behavior. Prior to that he earned his undergraduate degree in cognitive science with an additional focus on computer science from Vassar College.
MPFI shares expertise with scientists from across the globe during the 5th advanced Neuroimaging Course.

From February 03 – 15, The Max Planck Florida Institute for Neuroscience (MPFI) hosted the fifth advanced Neuroimaging Course. The laboratory-oriented program gives pre-doctoral students, postdoctoral students, and early-career investigators an intense and comprehensive training on the principles of modern imaging and the cutting-edge applications used to study the brain.

The two-week course included special lectures, collaborative discussions with distinguished scientists, and hands-on workshops highlighting novel neuroimaging techniques from leaders in the field, including Max Planck Society scientists, guest faculty, and lecturers. Catherine Dulac, Ph.D., Professor from Harvard University, and Vincent Pieribone, Ph.D. Professor from Yale University, gave exceptional lectures and led insightful discussions with the participants. The 2020 course was particularly unique because it featured Mackenzie Mathis, Ph.D., a former student of the 2016 Imaging Course, and now an assistant professor at Harvard University, as one of the special lecturers.

THANK YOU
MPFI is grateful for the generous support and presence of these partners that further enhanced the Advanced Imaging Course 2020 experience:

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FAU High School Jupiter Campus Launches Max Planck Academy Partner Program

The first class of the new FAU High School Jupiter Campus began classes this fall. Twenty-four students are enrolled and will benefit from partnership with Max Planck Florida’s Max Planck Academy training program. MPFI’s curriculum enhancements include “Introduction to Neuroscience,” “Advanced Life Sciences Tools” and “Neural Data Science.”
Max Planck Florida Welcomes 2020-2021 Postbacs

MPFI welcomed eight recent graduates to its 2020-2021 Postbaccalaureate Program. The students arrived at MPFI in September and quickly got to work, gaining hands-on lab experience throughout the institute. In addition to research, postbacs receive career development training in special meetings, adapted this year to ensure safety and social distancing requirements.

MPFI’s Postbaccalaureate Program provides recent college graduates who are planning to apply to graduate school an opportunity to spend one or two years performing full-time research at MPFI. Postbaccalaureate Fellows (“Postbacs”) work under the mentorship of some of the world’s leading scientists, in MPFI’s unique curiosity driven environment. Postbacs are regularly exposed to leaders in neuroscience outside of MPFI in the ongoing MPFI scientific seminar series and participate in a wide range of career education and professional development activities including workshops on graduate school application preparation, poster and oral presentations, and other topics aimed at helping postbacs become well-rounded scientific professionals. MPFI provides a vibrant and supportive training environment with regular scientific and social events to foster interactions between trainees and scientists at the institute.

This year’s Postbacs are:
- 01. Romy Aiken from FSU - Bolton Lab
- 02. Rory Cooley from the University of Maryland - Fitzpatrick Lab
- 03. Jacob LaMar from Indiana University - Rangaraju Lab
- 04. Micaiah McNabb from the University of Kentucky - EM core
- 05. Kelly South from New College of Florida - Yasuda Lab
- 06. Eleanor Stuart from FAU - EM core
- 07. Isaac Wendler from Yale University - Yasuda Lab
- 08. Zhongkai Wu from UCSD - Wang Lab
Each year, MPFI hosts a Career Panel to give students the opportunity to meet and hear from Max Planck researchers about what it’s really like to be a scientist. This year to honor social distancing requirements, Career Day was offered as a podcast that was shared with teachers throughout Palm Beach County. The 2020 Panelists were postdocs Dr. Anant Jain and Dr. Madineh Sedigh-Sarvestani, Research Group Leader Dr. Sarah Stern, and environmental, health & safety manager Eric Washburn.

The podcast was hosted by Neurotransmission Host Dr. Misha Smirnov, and Head of Education Outreach, Dr. Ilaria Drago. “Career Day” is an annual event that gives high school students the opportunity to meet and interact with Max Planck scientists. Panelists traditionally include scientists who are in different stages of their training, from post-baccalaureate students to principal investigators. 2020 Career Panel discussion explored many topics, including what inspired the scientists to choose a career in science, overcoming the challenges of balancing work and family, and what educational and research experiences got the researchers to the place that they are today.

2020 Panelists
- Sarah Stern, Ph.D., Research Group Leader
- Eric Washburn, Environmental, Health & Safety Manager
- Anant Jain, Postdoctoral Researcher
- Madineh Sedigh-Sarvestani, Research Fellow
Max Planck Florida Holds Two Science Meets Music Events
MPFI held two special events for the general public in February and March of 2020. "Science Meets Music" features visionary neuroscientists and their ground-breaking discoveries as well as enlightening performances by virtuosic musicians.

The series kicked off on February 5, 2020, with Dr. Peter Dayan, a world-renowned expert on artificial intelligence and computational psychology. Dr. Dayan discussed his work studying decision-making processes in the brain, the role of neuromodulators as well as neuronal malfunctions in psychiatric diseases. He has long worked at the interface between natural and engineered systems for learning and choice, and is also regarded as a pioneer in the field of Artificial Intelligence. Dayan was appointed in 2018 as a Director of the Max Planck Institute for Biological Cybernetics in Tübingen, Germany. The event was sponsored by the Corporate Creations Foundation.

The evening also featuring a piano recital from Sofia Martin, who performed selections in honor of the 150th anniversary of Beethoven’s Birthday in the first half of the program, followed by Sondheim’s “Send in the Clowns” and “The Impossible Dream” by Mitch Leigh, both as arranged by Liberace in honor of the recent anniversary of Liberace’s 100th birthday. She ended the evening by treating the audience to an encore of Israeli folksong “Hava Nagila,” and “Dance of Nature: The Storm” by Antonio Vivaldi which led to a standing ovation from the audience.
On March 4, Max Planck Florida welcomed Dr. Jens Frahm who discussed his work developing technology that dramatically speeds up MRI times and imaging quality. Jens Frahm is Director of Biomedical Nuclear Magnetic Resonance at the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany. Along with his team, Frahm invented FLASH (i.e., rapid gradient-echo) MRI which allowed for more than a 100-fold reduction in measuring time and emerged as one of the cornerstones of modern MRI. Current advances mark another breakthrough toward real-time MRI, i.e. the recording of MRI movies at very high temporal resolution.

The evening’s musical guest was tenor Michael Paul Amante who delighted the audience with a variety of popular songs from films, musicals, and operas.

A third Science Meets Music featuring Dr. Silvia Cappello and pianist Madison Yan was scheduled for April 12, 2020 but had to be canceled due to the pandemic. Max Planck Florida looks forward to resuming the series in 2022.

THANK YOU!

We express our gratitude to Becky and Jimmy Mayer for their generous gift of music throughout the 2020 Science Meets Music season.

MPFI is also grateful for the generous support of Corporate Creations for sponsoring one of the Science Meets Music receptions.
MPFI Attends AAAS Conference

Representatives from MPFI attended the Annual Meeting of the American Association for the Advancement of Science (AAAS), held February 13-16, 2020 in Seattle, Washington.

The AAAS seeks to “advance science, engineering, and innovation throughout the world for the benefit of all people.” The theme of the 2020 Meeting was about “Envisioning Tomorrow’s Earth,” and the program included discussions about the scientific endeavor at the forefront in developing innovations which have improved life on Earth in immeasurable ways. Because life on this planet is facing new challenges from both nature and the built world, the scientific community needs to respond with discoveries and developments to help solve many pressing problems.

In addition to networking and training opportunities, the conference provided the opportunity to showcase MPFI. Dr. Matthias Haury, MPFI’s Chief Operating Officer (COO), gave a presentation about MPFI and our role within the Max Planck Society to an audience interested in learning about our research and our training programs.
MPFI Scientists in the Community

MPFI researchers speak at Jupiter High School for Taras Foundation’s Meet the Scientist series and at FAU’s Boca Raton Campus as part of FAU’s Frontiers in Science Lecture series.

The Meet the Scientist series is a collaboration between the Taras Oceanographic Foundation, a non-profit organization founded in Jupiter, Florida, Jupiter High School, and the Jupiter Environmental Research and Field Studies Academy (JERFSA), a four-year academic program focused on ecological principles and processes, environmental awareness, field studies and research, critical thinking, and leadership skills. Since its inception in 2004, this lecture series has introduced more than 100 world-class scientists, attracts large audiences and has become one of the most successful programs of its kind in Florida.

Every year, two MPFI researchers are invited to participate of the Meet the Scientist series and share their research with the students of the Jupiter High School and members of the community. MPFI postdoctoral researcher, Dr. Juliane Jaepel from the Fitzpatrick lab was the featured speaker at Meet the Scientist, on Tuesday February 18, 2020. Her presentation was entitled “To See or Not To See: Blind Sight.” Another MPFI Research Fellow, Dr. Andre Steinecke from the Taniguchi Lab, presented a virtual talk at the Meet the Scientist series on Tuesday, November 10, 2020. Steinecke’s presentation was entitled “Becoming: Brain-Development from one single cell to the most complex structure known to humankind”.

MPFI Neural Data Scientist, Dr. Michael Smirnov, gave a public lecture on Friday, January 17, 2020 at FAU’s Boca Raton Campus as part of FAU’s Frontiers in Science public lecture Series. Smirnov’s talk was entitled “How AI and Machine Learning are Redefining Neuroscience.” This series aims to deepen the participant’s learning, explain the world, ignite the participant’s discussions, and bring the sciences’ richness to the community.

Dr. Juliane Jaepel, Postdoctoral Fellow, Fitzpatrick Lab, Taras Foundation’s Meet the Scientist series

Dr. Michael Smirnov, Neural Data Scientist, FAU’s Frontiers in Science public lecture series
Max Planck Images of Science Goes Virtual

The scientific art exhibition “Max Planck Images of Science” traveled to Missouri to be displayed at the Goethe Pop Up Kansas City. Unfortunately, due to COVID-19 the exhibit was closed to the public but reopened as a virtual experience.

The exhibit is a collection of 30 striking images captured during the course of scientific research from some of the Max Planck Society’s work, presented by the Max Planck Florida Institute for Neuroscience. On May 20, 2020 MPFI COO Matthias Haury represented MPFI during a virtual talk to an audience from the Goethe Pop UP Kansas City. He spoke about the Max Planck Society, how MPFI came to the United States and about the Images of Science Exhibit.
MPNeuro is your source for the latest neuroscience research news from the Max Planck Society. Max Planck scientists seek answers beyond the threshold of the unknown. Their discoveries play a key role in shaping our future and provide building blocks for innovation.

Representing the Max Planck Society culture of fostering the collaborative exchange of scientific ideas, the MPNeuro website provides a portal for research findings to be shared publicly with scholars, universities, and other organizations around the globe. Only with this necessary foundation of knowledge can researchers develop treatments and cures for brain disorders such as autism, schizophrenia, Parkinson’s disease, and Alzheimer’s disease.

The Max Planck Society brings together hundreds of neuroscience researchers throughout the world, equipping them with the best tools and resources to explore some of the most complex issues facing all facets of brain science. This collective knowledge and expertise promotes creative, interdisciplinary approaches – allowing Max Planck scientists to make significant advances in the field and develop innovative technologies and techniques to advance neuroscience research across the globe.

The MPNeuro research and news site thoroughly explores thought leadership and discoveries in all facets of brain science, including:

- Brain Disorders and Injury
- Cognition
- Development
- Integrative Physiology and Behavior
- Language and Communication
- Motivation and Emotion
- Motor Systems
- Neural Excitability, Synapses, and Glia
- Sensory Systems
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MPNeuro Highlights is a series of videos that give a fun, accessible overview to the top brain research coming from Max Planck institutes throughout the world. Like and subscribe today!

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Shared knowledge and expertise promotes creative, interdisciplinary collaborations, allowing Max Planck scientists to make significant discoveries in many fields and develop breakthrough technologies to advance neuroscience research across the globe.

Visit maxplanckneuroscience.org and subscribe to the mailing list to keep informed about our groundbreaking discoveries.
MPFI Hires new Vice President and Chief Development Officer

Following a national search, the MPFI CEO and Scientific Director David Fitzpatrick is pleased to announce the newest addition of our leadership team, Sean Coveleski as Vice President & Chief Development Officer. He will be responsible for leading advancement and philanthropic activities, as well as developing fundraising strategies to support the institute’s research and education programs. Coveleski joined the institute in November.

“Sean is an accomplished fundraising executive whose experiences and knowledge fit perfectly with our current needs and future plans,” said Matthias Haury, COO of MPFI. “He has a track record of innovation and achievement at an international, mission-driven nonprofit organization. He will be instrumental in increasing the Institute’s visibility and helping our generous supporters accomplish their philanthropic goals, and he has an excellent record of building a culture of philanthropy.”

Coveleski comes to MPFI most recently from Shriners Hospital for Children where he served as Senior Director of Corporate Engagement and Senior Regional Director of Planned & Major Giving. In those roles, he developed and led the corporate giving program, and worked across the country with dedicated supporters. During his tenure, Shriners Hospitals for Children saw significant increase in corporate giving, major and planned gifts, and new partnership development.

“I am incredibly humbled and excited by the opportunity to serve as the next Vice President and Chief Development Officer. I look forward to working with Dr. Fitzpatrick, colleagues, and friends to advance the mission of this world-renowned institution. The MPFI community feels like a family, and it is a privilege and pleasure to be here,” says Coveleski.

A native of Delaware, he is bringing a well-rounded background in philanthropy and law to the Institute. Coveleski earned his Juris Doctorate from Western Michigan University Cooley Law School and Bachelors of Arts in Mass Communication and Leadership Studies from West Virginia University. He and his wife, Maria, reside in Pompano Beach and enjoy exploring Florida’s state parks and waterways with their rescue dog Albert.

“I am incredibly humbled and excited by the opportunity to serve as the next Vice President and Chief Development Officer. I look forward to working with Dr. Fitzpatrick, colleagues, and friends to advance the mission of this world-renowned institution. The MPFI community feels like a family, and it is a privilege and pleasure to be here.”

Sean Coveleski, Vice President & Chief Development Officer

“I look forward to meeting the amazing donors and friends of the institute whose efforts and generous support have made such a difference here at Max Planck Florida. We will continue to build strong relationships that will support curiosity-driven research and today’s students as well as future generations of researchers.”
On October 16th, MaryLynn Magar, a member of the Florida House of Representatives for District 82, visited MPFI for a special tour before leaving office in November. Joining her was incoming representative John Snyder. Since MaryLynn’s service began in 2012, the Hobe Sound resident has successfully fought for numerous initiatives that allowed FAU and Max Planck to grow together and establish one of the most robust neuroscience education programs in the country. She has repeatedly expressed her pride for the state’s continued investment in the unprecedented educational programs and groundbreaking research partnerships that are taking place in Jupiter.

In 2018 when asked to identify her greatest legislative victories, Magar cited efforts to ensure “the triangle between Florida Atlantic University, Scripps and Max Planck is solid,” (TCPalm 10/7/2018). MaryLynn is a friend of the institute who not only talked the talk, but walked the walk when she established the MaryLynn Magar Fellowship, which is available to students in the FAU/Max Planck Data Science enrichment program. This program gives high-performing juniors and seniors from FAU High in Boca Raton the opportunity to commute to the Jupiter campus to work with Max Planck faculty in their labs. Magar Fellows will receive $3,000 to support their research efforts.

Each year the Magar Fellowship is reminder of MaryLynn’s unswerving determination and effort to bring our two institutions together. Thank you, MaryLynn, for your longstanding support and your dedication to the education of tomorrow’s researchers.

Thank you,
MaryLynn Magar

Staying Connected with Brainwaves eNewsletter

2020 challenged us to connect with each other in new ways, and when we closed to visitors, tours, and public events we launched an eNewsletter to share the good news happening at MPFI with our donors and community of friends. It’s a reason to feel good about supporting MPFI and a way you can see what MPFI is doing in the labs, in mentoring and education, and in our community. The newsletter is emailed out every four to five weeks and includes success stories from the labs here in Florida and from our family of 86 institutes worldwide. The Brainwaves newsletter is part of a growing lineup of free ways to connect with Max Planck wherever and however you want, including our social media channels, podcast, and quarterly print magazine.

If you would like to receive the Brainwaves eNewsletter email news@mpfi.org or visit mpfi.org/email to sign up. We hope you enjoy reading the latest news from MPFI, and you can see how your support makes a difference to neuroscience and education. Throughout the year we’ll continue to give you a first-hand look at the latest research and you can get to know the scientist and students who are on the forefront of scientific discovery. As always, it wouldn’t be possible without you! Thank you for inspiring us to seek new ways to share our story and reaffirming how together we will change the future of neuroscience.

Max Planck Florida Institute for Neuroscience
Brain Waves Newsletter
THANK YOU!
We recognize the individuals and organizations most deeply invested in the advancement and future success of MPFI. Your transformational gifts make extraordinary discoveries possible and embolden our researchers to take risks, develop new technologies and pursue innovation.

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We’re grateful for the financial support of our generous donors. Together we’ll provide a curiosity-driven research environment where creativity, innovation, and dedication drive tomorrow’s scientific discoveries.

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We would like to express our gratitude to our Boards of Trustees for their continued leadership and support.

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MPFI offers unique opportunities for companies looking to partner with the institute in its mission of uncovering all that is unknown about the brain. Through the Institute’s Corporate Partner Program, companies who share our goal of advancing neuroscience research will be recognized in a variety of ways for their support. These partners are also granted advanced and exclusive access to our “Friends of MPFI” program and provided ample opportunities to engage with the scientific community.

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