

Max Planck Florida Institute for Neuroscience

Matthias Haury, PhD





History



The Max Planck Society

- Germany's Most Successful Research Organization
- An Exceptional Track Record of Scientific Achievement
- Physics, Chemistry, Mathematics, Biology, Medicine



- 84 Institutes
- 18 Nobel Laureates
- 1100 Inventions
- 90 Spin-off Companies





A Shared Vision

Max Planck Florida Institute for Neuroscience





The Building

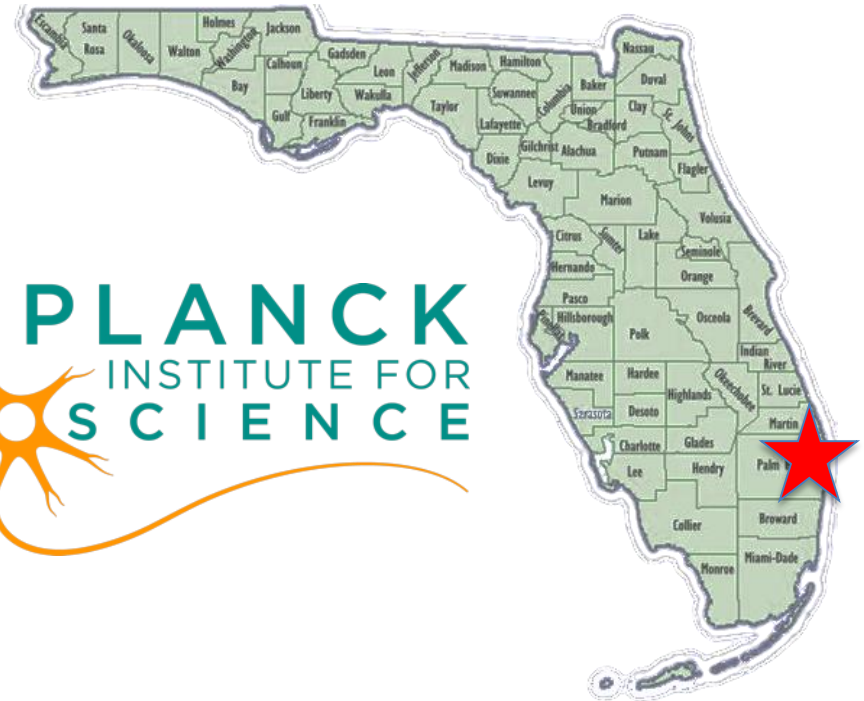
One Max Planck Way - Jupiter



- 100,000 Square Feet
- State of the Art Facility
- LEED-NC Certified Gold
- 19.9% Small Business Participation

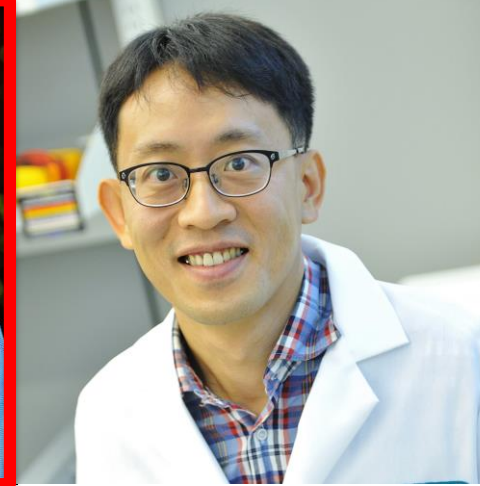


Only One Max Planck Institute Outside of Europe



in Palm Beach County





McLean Bolton

Disorders of Neural Circuit
Function

Jason Christie

Mechanisms of Synaptic
Signaling and Computation

David Fitzpatrick

Functional Architecture and
Development of Cerebral
Cortex

Hyungbae Kwon

Cellular Basis of Neural Circuit
Plasticity

8 Research Groups - 1 Guest Group

James Schummers

Cellular Organization of Cortical
Circuit Function

Hiroki Taniguchi

Development and Function of
Inhibitory Neural Circuits

Ryohei Yasuda

Neural Signal Transduction

Sam Young

Molecular Mechanisms of
Synaptic Function





Scientific Focus - the Brain

- Most complex living structure in the known universe
- Impacts every aspect of our lives
- The key to understanding who we are and why we behave the way we do
- The key to diagnosis, treatment, and cure of a host of devastating neurological and psychiatric disorders





Neurological and Psychiatric Disorders

Alzheimer's
Autism
Epilepsy
Schizophrenia
Parkinson's Disease
Bipolar Disorder
Depression
ADHD
Addiction
Stroke
Post-Traumatic Stress Disorder





Impact of Brain Disorders

- More than 1,000 Disorders of the Brain and Nervous System
- More Hospitalizations than any other disease group, including Heart Disease and Cancer
- Impacts 1.5 Billion People World Wide
- Impacts 100 Million Americans
- Annual Cost of \$700 Billion in the US





What is Limiting Progress on Brain Disorders?

Understanding the **basic science** of
brain function.

‘Insight must precede application’

*‘You can’t fix it if you don’t know how it
works’*

Today’s **basic science**:
the foundation for tomorrow’s cures.



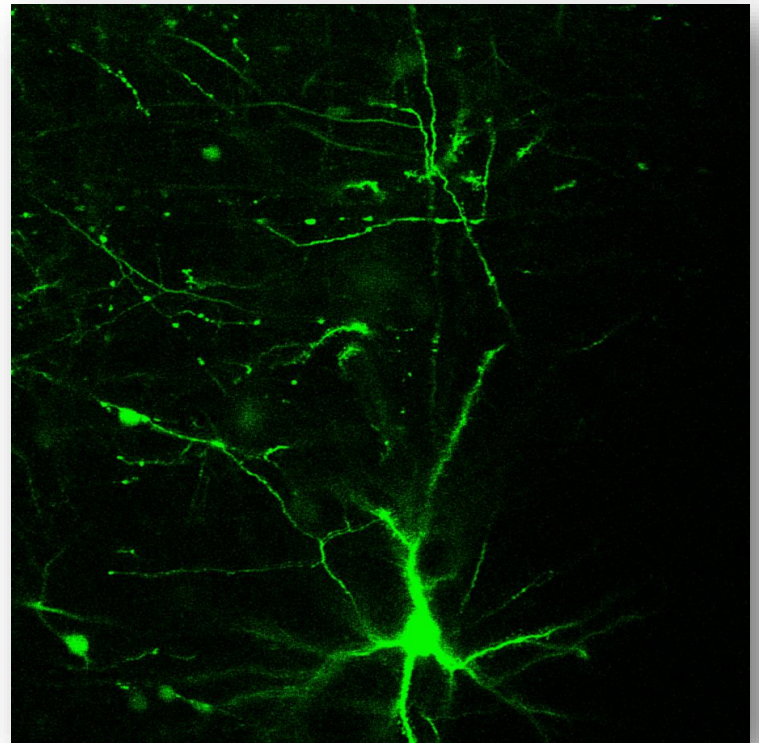


**Basic
Research**



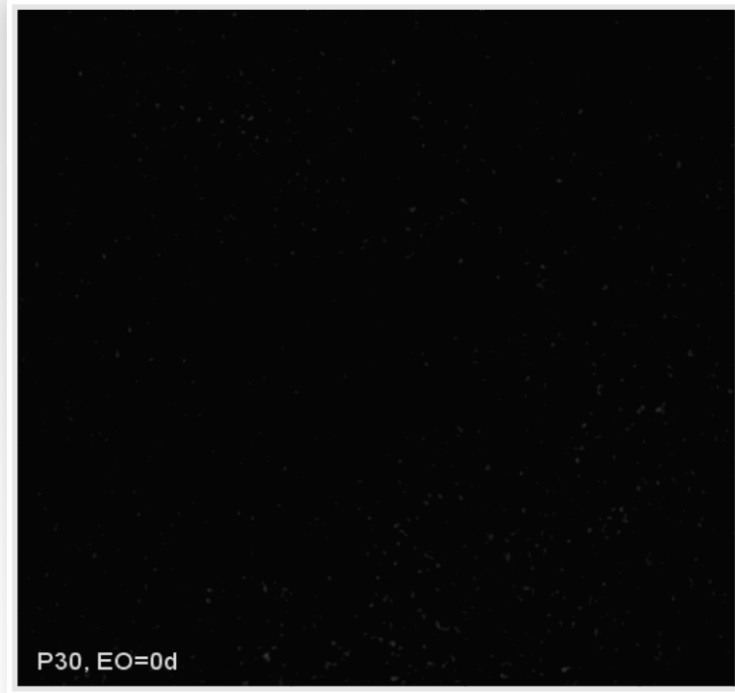
New Technologies for Imaging Living Neurons

- Combining Physics and Molecular Biology
- A Revolution for Visualizing Brain Structure, Function, and Development
- Critical for Understanding Brain Disorders

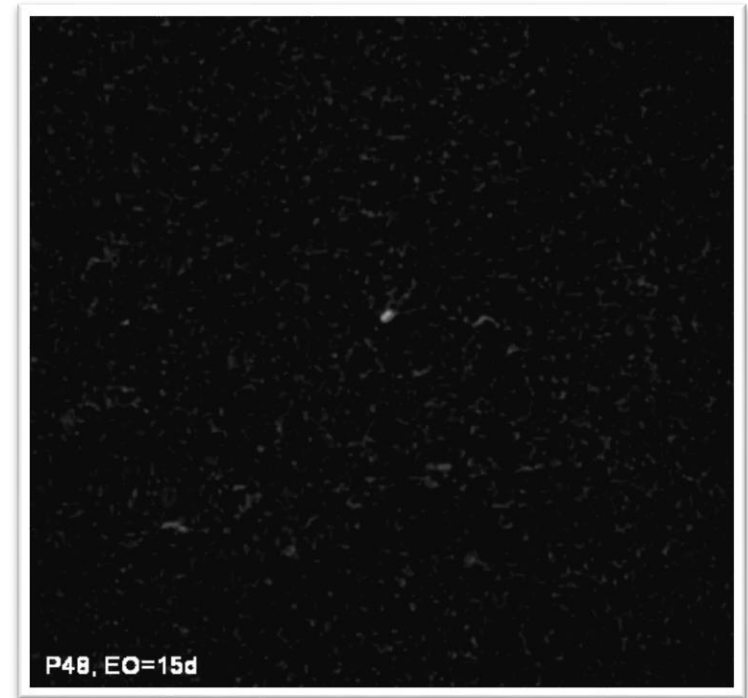




Neural Circuit Development



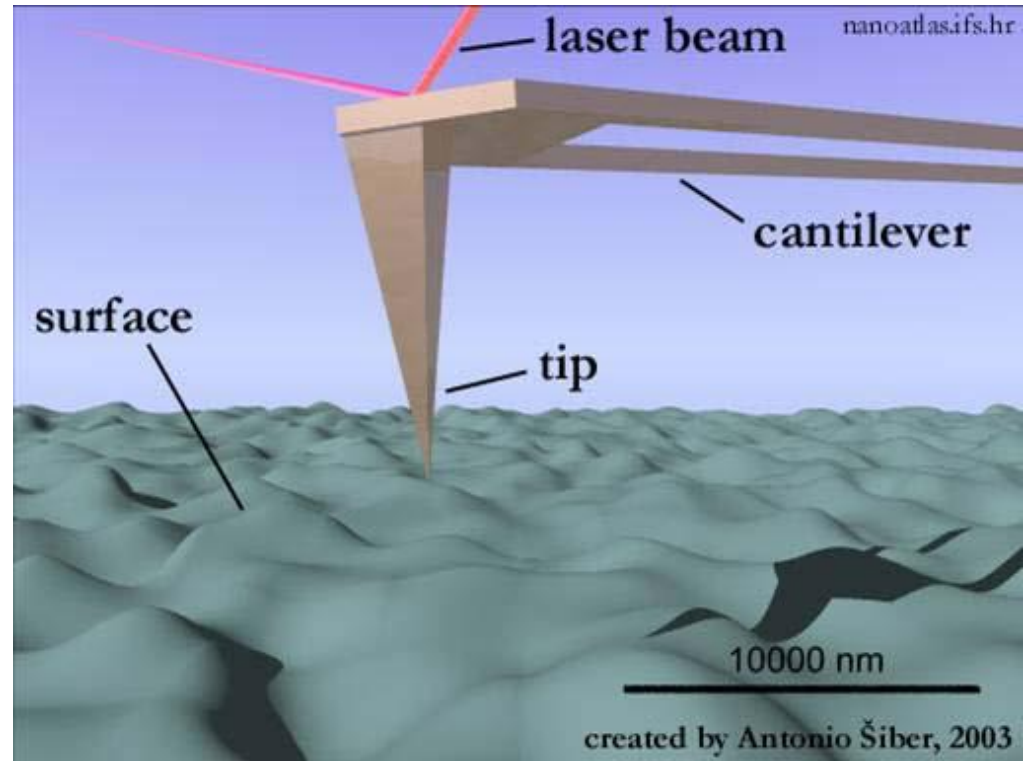
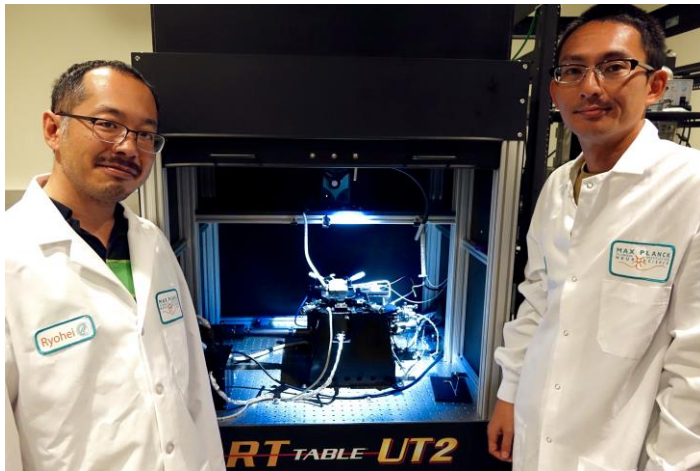
less than 1 day experience



15 days experience



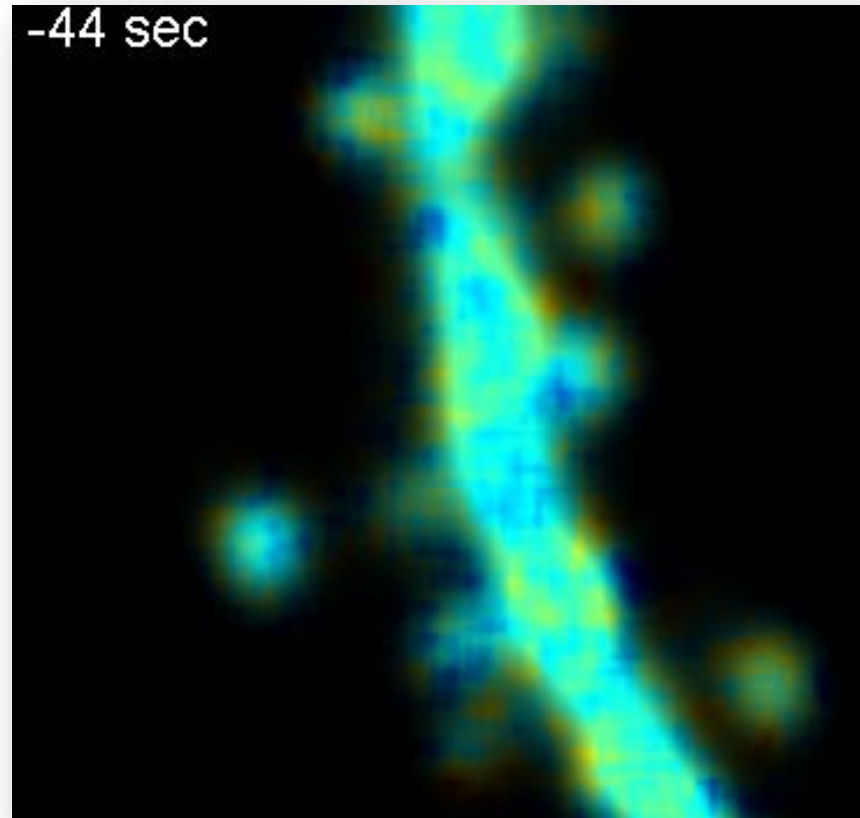
Atomic Force Microscopy Nanoscale Imaging



Cultured hippocampal neuron at 9 DIV



Visualizing the Molecules of Memory







NIH Director's Pioneer Award

NIH DIRECTOR'S



PIONEER
A · W · A · R · D

Pioneer Award supports individual **scientists of exceptional creativity**, who propose **pioneering and transforming approaches** to major challenges in biomedical and behavioral research.

4.8M



Training



Post Baccalaureate Research Experience

- Provides research experience to students who have graduated from college and are planning to apply to graduate or professional school in the future.
- Enormously successful in its first 6 months.
- Over 100 applicants from schools such as Johns Hopkins, Washington University, Cornell, UPenn, MIT just to name a few.
- Currently there are 13 students in the program and 8 more will be joining in June 2015.



Dr. Rebekah Corlew
PRE Program Coordinator

PRE Program

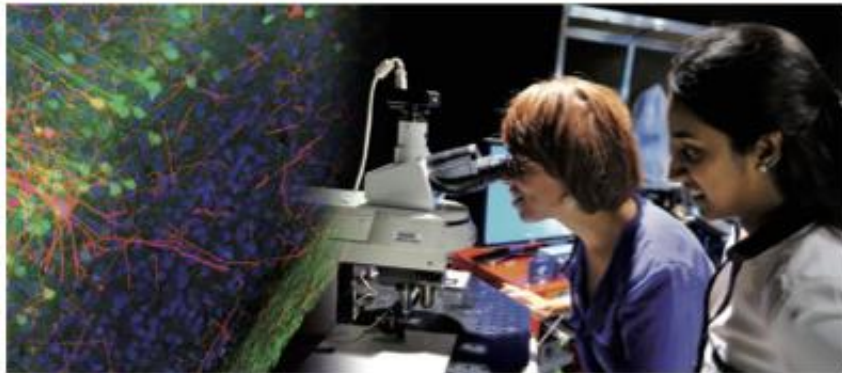
Post-baccalaureate
Research Experience



Supported by the State of Florida



Integrative Biology & **Neuroscience** Program



www.science.fau.edu/neuroscience/iban
www.maxplanckflorida.org/iban

IBAN Program Overview

The Integrative Biology doctoral degree program at Florida Atlantic University (FAU) has joined forces with Max Planck Florida Institute for Neuroscience, the first U.S. institute of the world-renowned Max Planck Society, to offer students a Ph.D. with an emphasis in neuroscience. The Integrative Biology and Neuroscience (IBAN) program is based on FAU's Jupiter, Florida campus. IBAN students explore cutting-edge questions in neuroscience through the integration of multiple disciplines, different model systems, and a broad spectrum of technology. Rotations through various research labs in combination with coursework in cell and molecular biology, scientific communication, statistics, and neuroscience give IBAN students exceptional training in practical and theoretical neuroscience.





IMPRS Brain and Behavior

■ caesar



universität**bonn**

Rheinische
Friedrich-Wilhelms-
Universität Bonn

FAU
FLORIDA
ATLANTIC
UNIVERSITY



MAX PLANCK
FLORIDA INSTITUTE FOR
NEUROSCIENCE





IMPRS Brain and Behavior

- 2-3 weeks core course in Germany
- Mathematics & physics training
- Advanced imaging techniques
- Interdisciplinary mini-courses in Florida and Bonn
- Collaboration with other Neuroscience IMPRS (Göttingen, Munich...)
- PhD Retreat & Symposium
- Soft-Skills & Career Development
- PhD degree from Bonn University or FAU





Sunposium 2015

SUNPOS



Sun

Max Planck Florida Institute
2015, the second biennial conference
issues at the forefront of neuroscience

The two-day conference features
Planck Society and researchers from
States and Europe.

This year's event will be held at
Beach Gardens, Florida.



Eric Betzig

Group Leader, Janelia Research
Campus

- Eric Betzig
- Tobias Bonhoeffer
- Karl Deisseroth
- Winfried Denk
- Catherine Dulac
- Florian Engert
- Rainer Friedrich
- Michael Häusser
- Richard Huganir
- Na Ji
- Yishi Jin
- Erik Jorgensen
- Gilles Laurent
- Loren Looger
- Richard Mooney
- J. Anthony Movshon
- Thomas Mrsic-Flogel
- Botond Roska
- Massimo Scanziani
- Erin Schuman
- Songhai Shi
- Richard Tsien
- Gina Turrigiano
- Xiaowei Zhuang

SUNPOS IUM

2015
MARCH
30-31

PGA National Resort & SPA
Palm Beach Gardens, Florida

www.sunposium.org



MAX PLANCK
FLORIDA INSTITUTE FOR
NEUROSCIENCE

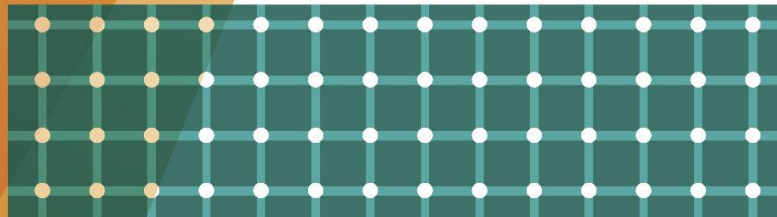
CONTACT US REGISTER

March 30 - 31



Winfried Denk

Department of Biomedical
Max Planck Institute for
Neurobiology; Adjunct Professor,
Neurobiology, University of
Tübingen; ERC Senior Fellow,
Department of Neurobiology,
Max Planck Institute for
Neurobiology





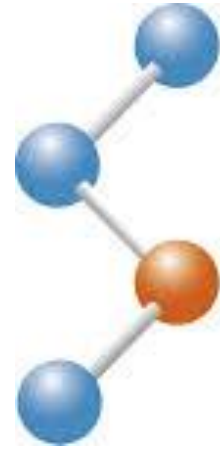
SUNPOSIUM 2015



Dr. Eric Betzig - Nobel Prize Chemistry, 2014



**Jupiter
Campus
Initiative**



SCRIPPS
FLORIDA™

THE SCRIPPS RESEARCH INSTITUTE



MAX PLANCK
FLORIDA INSTITUTE FOR
NEUROSCIENCE





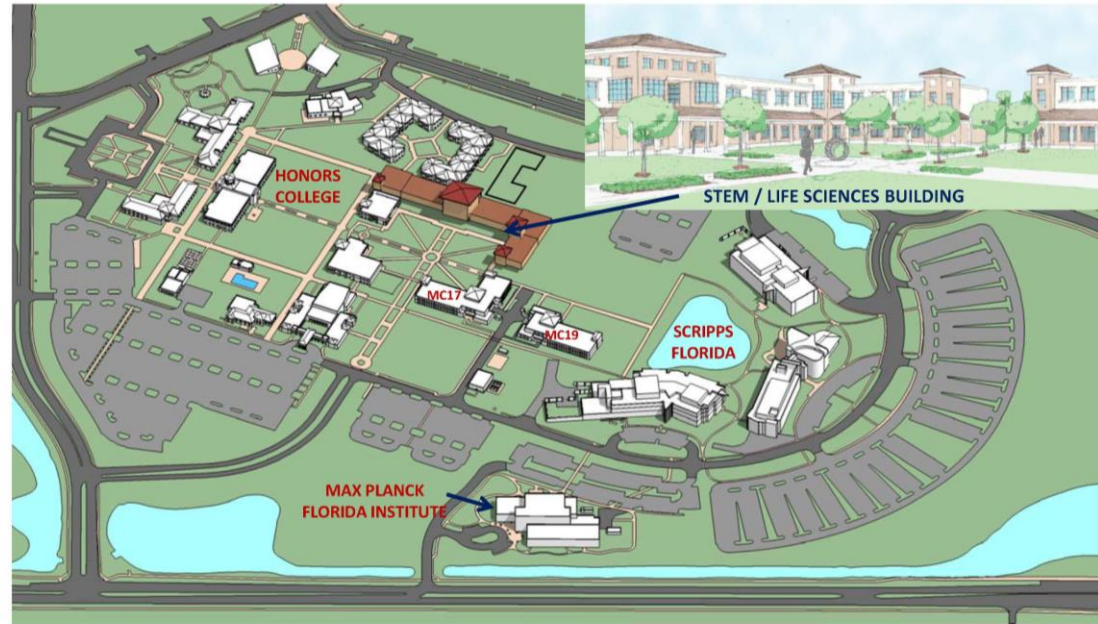
FAU Jupiter Campus

FLORIDA ATLANTIC UNIVERSITY. **FAU**

FAU STEM / LIFE SCIENCE BUILDING - \$29 M



John Kelly FAU President



Plans for new STEM/Life Science Building





“We have only begun to tap the tremendous potential that this campus holds for scientific excellence. By joining forces in planning new scientific and educational initiatives, recruiting outstanding new faculty, and exploring common needs for new technologies and scientific infrastructure, we will achieve an exceptional degree of synergy that will propel the Jupiter campus to new heights, as a driving force in biomedical research. The scientists and staff at the MPFI are excited to be working with our colleagues at FAU and Scripps to make this a reality.”

David Fitzpatrick March 2, 2015



FAU, Scripps Florida, Max Planck Announce Plans for Groundbreaking Research and Education Collaboration

FAU and two of the world's premier research institutions will create one-of-a-kind education programs that will attract the best and brightest students to Palm Beach County, and transform FAU's John D. MacArthur Campus in Jupiter into a hub of scientific inquiry, innovation and economic development.

[Read More →](#)



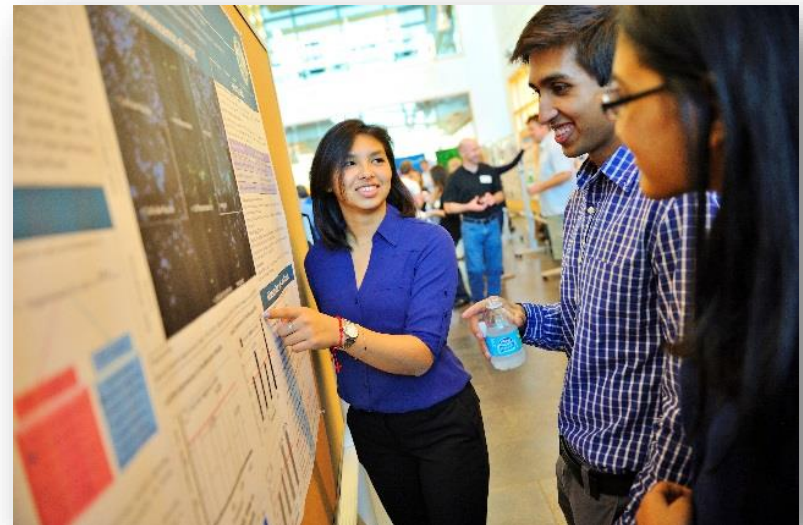


2nd Annual Jupiter Neuroscience SYNAPSE

- Over 200 participants gathered in the Alexander and Renate Dreyfoos Atrium to share research findings
- Scripps, FAU, MPFI, Nova Southeastern University, Torrey Pines Institute, VGTI and Palm Beach State College

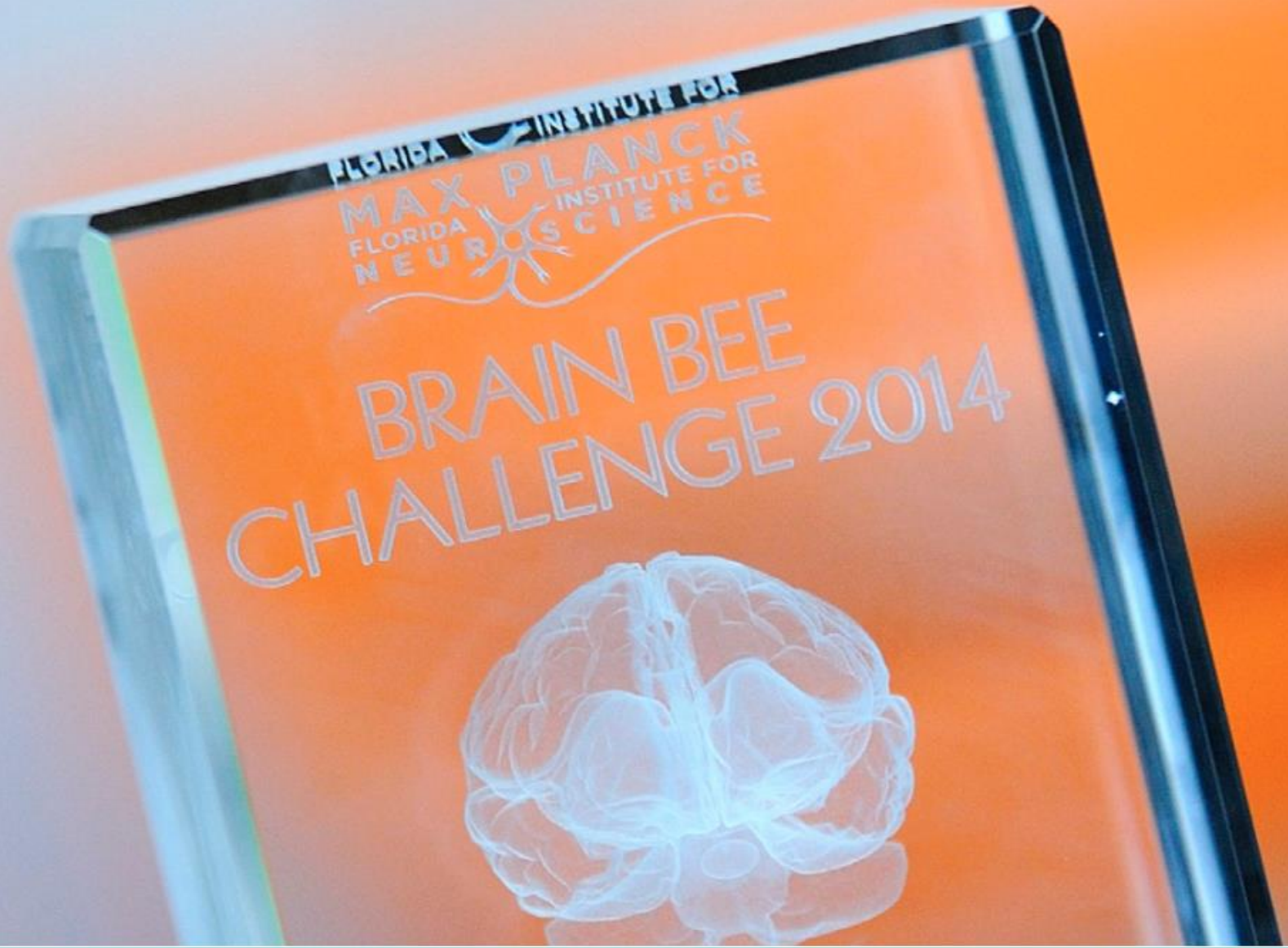


“Who says neuroscientists don't know how to network?”





**Educational
Outreach and
Public
Engagement**



Brain Bee



“PBC students compete in Max Planck’s Brain Bee”





2015 Public Lecture Series

Science meets Music



backstage pass take5

Ryohei Yasuda

NEUROSCIENTIST/PIANIST

At a special performance of Max Bruch's "Violin Concerto in G minor, op. 26" last spring at Society of the Four Arts, a dapper Ryohei Yasuda, dressed entirely in white, sat at the piano, his nimble fingers gliding gracefully across the keys. He was providing the sturdy foundation for his son, Tatsuka, a music student at Dreyfoos School of the Arts, whose violin solo captured all the nuance of Bruch's famous composition, from its weeping sections to its fiery finish.

The elder Yasuda seemed at home standing away from the spotlight. Though he grew up in his native Japan, mastering Bach and Beethoven on his family's old piano—he can still play Tchaikovsky concertos from memory—he's accustomed, by now, to his musical life taking a backseat, thanks to his day job.

Yasuda is a neuroscientist. In 1998, he received his Ph.D. in physics from Keio University in Yokohama; in his Ph.D. study, according to his official biography, he "demonstrated that the enzyme ATP synthase is a rotary motor made of a single molecule, and its energy conversion efficiency is close to 100 percent," which sounds really important.



"We find that when we present [science and music] together, the audience recognizes and appreciates the artistry and dedication in both."



Science meets Music @ MPFI





MAX PLANCK
FLORIDA INSTITUTE FOR
NEUROSCIENCE

Thank You