



# DEPARTMENT OF NEUROBIOLOGY AND BEHAVIOR

## *Spring 2021 Newsletter*

### Message from the Chair

Dear Friends and Alumni,

It is finally spring! Yes!!!

This is always an exciting time of the year, with preparations for commencement, plans for a happy summer of research and outdoor activities, nice weather peeking through, the campus blossoming and everyone feeling in a better mood. This year it feels even more hopeful than usual. Thanks to a very effective vaccine campaign the campus can finally see the light at the end of a long tunnel.

The winter and early spring have been very busy around the Department. We safely continued to repopulate our laboratories and offices and our research activities picked up at a good pace.

Students, postdocs, research staff and faculty in the Department made substantial progress in many research areas. During the past months, we published articles in impactful journals (such as Cell Reports, Current Biology, eLife, Neuron, and PLOS Computational Biology, just to name a few) on topics such as dopaminergic modulation of circuits in the striatum, taste processing and learning, decision making, computational modeling of social learning and aging, and transposable genetic elements and neurodegeneration. The diversity of these research topics reflects the breadth of our scientific interests that go from genetics to neural circuits and behavior all the way to theoretical neuroscience. Neuroscience is by nature an interdisciplinary field, and the variety of approaches and perspectives in the Department ensures the circulation of exciting ideas and collaborations.

In January, our latest recruit, Dr. Prerana Shrestha, opened her lab in the newly renovated space on the 5th floor of the Life Sciences building. It is a sparkling new lab, filling up with new members, new equipment and a lot of excitement. From January to March, we engaged in a very active graduate recruitment season, which resulted in an outstanding class of PhD and MS candidates arriving at the end of the summer. In this time filled with gloom, it is truly wonderful to see new beginnings!

In March, we also celebrated Brain Awareness Week. We gave lectures at SUNY Old Westbury, organized brain related virtual activities at local libraries (a big thanks to Drs. Jennifer Blackwell, Lindsey Czarnecki, and Hillary Schiff from our postdocs group), posted work from Art + the Brain (a wonderful course held by Dr. Patricia Maurides in the Department of Art), exhibited work kindly donated to the Department by the German photographer Volker Schultz (thank you!) and finally disseminated brain images in the community ... finders keepers.

In April, the PhD students of the Program in Neuroscience organized the first (and hopefully last) virtual Symposium in Neuroscience, a day celebrating our students' research. It was a success, despite the Zoom format we all felt the excitement of a live event. Phenomenal talks from our students, and a stellar keynote speaker (Dr. Michael Hasselmo from Boston University). Next time it will be in person!

After a one year hiatus, the Thomas Hartman Center for Parkinson's research will again hold the competition for pilot grants to stimulate research in this field. I would like to thank all of you who support the Center through your generous gifts, fundraising and advocacy.

Throughout the semester we continued to host our virtual seminars. We are now planning for next year's seminar season and we are optimistic that we may restart to have in person visits. We are also planning for September's Departmental retreat. If possible, we will gather in person at the beautiful Old Field Club for a day of presentations, posters and discussions.

In conclusion, we made the best of the situation, and we kept carrying on with enthusiasm, our passion for research, education and outreach.

I hope you will enjoy reading our newsletter, for me it is always a pleasure to connect with friends and alumni. Please feel free to reach out to me!

**Alfredo Fontanini**

Professor and Chair

Department of Neurobiology and Behavior

# Congratulations!

- Congratulations to **Dr. Liang Chen**, Postdoc in the Xiong Lab, who has been offered an Assistant Professor position in the School of Basic Medical Sciences at Fudan University in Shanghai, China.
- Congratulations to Postdoc **Olivia Swanson** (Maffei Lab) who got 2nd place in the SBU Postdoc Spotlight event in February with her 5-minute talk "The Science of Feeling Full." More info on the event [here](#).
- Congratulations to PhD Student **Priscilla Yevo** (Maffei Lab) as one of 22 inaugural recipients of the new SUNY Graduate Research Empowering and Accelerating Talent Awards. Recipient bios and more on the award [here](#).
- Congratulations to **Dr. Maya Shelly** (PI) on receiving both a Stony Brook University OVPR Seed Grant award and SUNY Seed Grant award.

# Special Events

Our 19th Annual Symposium in Neuroscience, organized by PhD students, took place on April 20, 2021, 9am-1pm, with keynote speaker Dr. Michael Hasselmo, Boston University. The event showcased our students research projects in a series of virtual presentations.

## 19th Annual Symposium in Neuroscience

### Coding of Space and Time in Cortical Structures

**AGENDA**

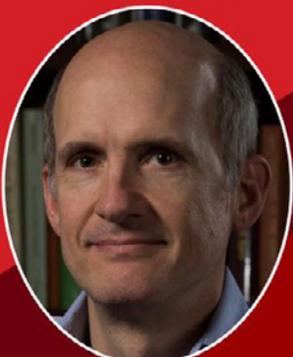
9:00 - 9:05 Intro/Greeting  
 9:05 - 10:45 Student Talks  
 10:45 - 11:10 Break  
 11:10 - 11:30 Student Talks  
 11:30 - 12:30 Keynote Speaker  
 12:30 - 1:00 Student- Speaker Hangout!

**Join Us**

Date: April 20, 2021  
 Time: 9:00 AM - 1:00 PM  
 Location: Zoom  
 Contact: [joshua.kogan@stonybrook.edu](mailto:joshua.kogan@stonybrook.edu) or  
[Tianshu.Li@stonybrook.edu](mailto:Tianshu.Li@stonybrook.edu)

Website: [bit.ly/SBUSIN2021](http://bit.ly/SBUSIN2021)  
 Twitter: @SBUNeurobiology  
 #SBUSIN2021

Sponsored by the Graduate Student Organization (GSO)



**Dr. Michael Hasselmo**

Center for Systems Neuroscience  
 Department of Psychological and  
 Brain Sciences

**Boston University**





## The 19th Annual Symposium in Neuroscience Program

9.05 - 9.15	<b>Katherine Denney</b> Sex Differences in Genomic Stress Response
9.15 - 9.25	<b>Priscilla Yevo</b> The Role of Extrasynaptic GABAAR Signaling in the Insular Cortex on Taste-Dependent Impulsive Behavior
9.25 - 9.35	<b>Andrea Arreguin</b> Exploring the Role of the DMD Protein Dystrophin in the Subventricular Zone
9.35 - 9.45	<b>Lilly Talbot</b> Discovery and Validation of Biomarkers for TDP-43 Proteinopathies
9.45 - 9.55	<b>Alan Guo</b> Non-Vesicular Lipid Transport at ER-PM Contact Sites in the Developing Hippocampus
9.55 - 10.05	<b>John Chen</b> The Role of Cortical D1R-Expressing Neurons in Taste-Based Sensorimotor Transformations
10.05 - 10.15	<b>Amalia Napoli</b> NMDARs Regulate Neurogenesis in Zebrafish Larvae
10.15 - 10.45	<b>Piotr Sokol</b> Neural Oscillations, Memory, and Learning to Time Behavior
11.10 - 11.20	<b>Afrinash Ahamad</b> Role of Lipid Metabolism in Dentate Gyrus During Seizure
11.20 - 11.30	<b>Josiah Zoodsma</b> Subunit Specific Roles of NMDA Receptors in Early Development
11.30 - 12.30	<b>Dr. Michael Hasselmo</b> Coding of Space and Time in Cortical Structures

# Brain Awareness Week: March 15-21, 2021

Our Department celebrated global Brain Awareness Week by giving multiple neuroscience lectures in the community and sharing brain art and images of the brain around the Stony Brook area and on Twitter.

Through an event called "Free Brains," original images of neurons and brains taken from scientists in the Department were printed, framed and given to our community. Each image had a title and short description, and was left in a prominent place in the Stony Brook community. We then tweeted hints of where to find the framed images for anyone wanting to go search for them!



**STONY BROOK UNIVERSITY**  
DEPARTMENT OF  
NEUROBIOLOGY & BEHAVIOR

**BRAIN AWARENESS WEEK**  
Dana Foundation  
Stony Brook University

**BRAIN AWARENESS WEEK SCHEDULE**  
MARCH 15-21, 2021

**WEEK-LONG EVENTS**

**"FREE BRAINS"**  
FIND NEURO-RELATED IMAGES AROUND THE STONY BROOK COMMUNITY. FINDERS KEEPERS!  
FOLLOW @SBNEUROBIOLOGY ON TWITTER FOR CLUES TO IMAGE LOCATIONS.

**WEDNESDAY, MARCH 17 2:30PM**  
SUNY OLD WESTBURY LECTURE  
DR. HOWARD SIROTKIN  
"NMDAR IN NEURAL DEVELOPMENT AND DISEASE"  
[JOIN VIRTUAL LECTURE HERE.](#)

**WEDNESDAY, MARCH 17 7-8PM**  
MIDDLE COUNTRY PUBLIC LIBRARY  
JENNIFER BLACKWELL AND LINDSEY CZARNECKI  
"SHUT EYE, ACTIVE BRAIN: WHAT YOUR BRAIN DOES WHILE YOU SLEEP"  
FOR TEENS AND ADULTS  
[REGISTER HERE FOR WEBINAR.](#)

**THURSDAY, MARCH 18 2:30PM**  
SUNY OLD WESTBURY LECTURE  
DR. MARY KRITZER  
"SEX AND SEX HORMONE EFFECTS ON EXECUTIVE MEMORY FUNCTION IN RATS: IMPLICATIONS FOR HEALTH, AGING, AND NEUROPSYCHIATRIC DISEASE"  
[JOIN VIRTUAL LECTURE HERE.](#)

**THURSDAY, MARCH 18 5PM**  
MIDDLE COUNTRY PUBLIC LIBRARY  
HILLARY SCHIFF  
"FLAVOR IN YOUR BRAIN: A TAKE & TASTE PROGRAM"  
CHILDREN'S PROGRAM (1ST THRU 5TH GRADE)  
[JOIN VIRTUAL PROGRAM HERE.](#)

**WEEK-LONG EVENTS**

CHECK OUT TWITTER FOR SPOTLIGHTS ON RESEARCHERS IN THE STONY BROOK NEUROBIOLOGY & BEHAVIOR COMMUNITY  
[@SBNEUROBIOLOGY.](#)



## Alumni Spotlight



### Matt Gardner

I received my BS in physics at Boston University before deciding to switch over to, what seemed to me at the time, a much younger and more exciting field in neuroscience. After a stint as a research technician at Harvard Medical School and with several post-

baccalaureate courses in biology and neuroscience under my belt, I joined the PhD program in Neuroscience at the Department of Neurobiology and Behavior in 2008. Following a few rotations, I joined the Fontanini Lab, becoming the first graduate student in the freshly minted lab area of the northeast corner of the 5th floor of the Life Sciences Building, the 'North End' (a reference to Boston where several of us in the lab, including Arianna and Alfredo, had recently lived).

The next five years of my life were primarily spent in that corner of the building, collecting data and having fun with the vibrant community of the Department, which for me, primarily centered around the people of the Fontanini and Maffei Labs. Coffee, music, jokes and cart riding were just a few of the activities that, in addition to the science, made long lab hours seem to go by too quickly. Under Alfredo's mentorship, I continued a line of research that Alfredo had begun as a post-doc at Brandeis University. The broader question we sought to address is how neural processes underlying sensory perception are shaped and influenced by prior experience. To do this, we studied how single neurons in the gustatory (taste) system respond under conditions in which animals can predict, or not, upcoming gustatory stimuli. It quickly became apparent to me how useful the taste system is as a model system for understanding predictive processes in the brain – seeking and consuming food based on the chemosensory qualities of foods (the smell, flavor, texture and taste of a food) is a fundamental process within biology, generally.

After an extremely fulfilling and productive time at Stony Brook in the Fontanini Lab as a graduate student, I continued to pursue this line of research in Geoffrey Schoenbaum's lab at the National Institute of Health. My goal as a post-doc has been to develop stronger methods to isolate various types of information about predicted stimuli. For example, to know if predictive coding in the brain contains information about the specific type and amount of food potentially available when searching for food, the experimenter must first be sure that the experimental subject 'knows' about this information. I recently developed behavioral tasks in rats to address these issues. One behavior that I have worked on extensively is a task in which rats must integrate information about the potential amount of food with the type of food in order to make a rational choice. More recently, this has led me to explore how animals keep track of an 'appetitive space' of various foods, and how such a cognitive space can be used to make decisions about which foods to pursue.

This summer I will be starting as an Assistant Professor at Concordia University in Montreal, where I will continue to study predictive processes in associative learning and decision making. I am currently recruiting people to join the lab.

#### Selected Publications:

Gardner MP, Sanchez D, Conroy JC, Wikenheiser A, Zhou J, Schoenbaum G (2020). Orbitofrontal processing is required for estimating subjective preference during initial but not established economic choice. *Neuron* 108(3):526-537.e4.

Gardner MP, Schoenbaum G, Gershman S (2018). Rethinking dopamine as generalized prediction error. *Proceedings Royal Society B*. 285:20181645.

Gardner MP, Conroy JC, Styer CV, Shaham MH, Schoenbaum G (2017). Lateral orbitofrontal inactivation dissociates devaluation-sensitive behavior and economic choice. *Neuron* 96(5):1192-1203.

Gardner MP, Fontanini A (2014). Encoding and tracking of outcome-specific expectancy in the gustatory cortex of alert rats. *Journal of Neuroscience* 34(39): 13000-17.

