# John D. Murray

Yale University School of Medicine
Department of Psychiatry
40 Temple St., Suite 6E
New Haven, CT 06510

WEBSITE: murraylab.yale.edu
EMAIL: john.murray@yale.edu

## Professional Position

2015–pres. **Assistant Professor** of Psychiatry, of Neuroscience, and of Physics
YALE UNIVERSITY
Principal Investigator, Murray Lab
Department of Psychiatry
Department of Physics (Secondary Appointment)
Department of Neuroscience (Secondary Appointment)
Co-Director, Swartz Program in Theoretical Neurobiology
Interdepartmental Neuroscience Program (INP)
Integrated Graduate Program in Physical and Engineering Biology (PEB)

## Past Positions

2013–15 **Postdoctoral Associate**
NEW YORK UNIVERSITY, Center for Neural Science
*Advisor:* Xiao-Jing Wang, Ph.D.

2006–07 **Fulbright Scholar**, France
ÉCOLE NORMALE SUPÉRIEURE DE CACHAN

## Education

2013 **PH.D. in Physics**
2010 **M.PHIL. in Physics**
2008 **M.S. in Physics**
YALE UNIVERSITY
*Advisor:* Xiao-Jing Wang, Ph.D.
*Dissertation title:* Local and long-range dynamics in cognitive cortical circuits

2006 **B.S. in Physics and Mathematics** (double major), *cum laude*
YALE UNIVERSITY

## Selected Awards & Honors

2017 Outstanding Reviewer, Journal of Neuroscience

2016 Scholar Award. Yale Center for Clinical Investigation (YCCI)

2015 Finalist for Burroughs Wellcome Fund's Career Award at the Scientific Interface

2012 30 under 30: Science & Healthcare. *Forbes* [LINK]

2006 Fulbright Scholarship. U.S. DEPARTMENT OF STATE

2006 Howard L. Schultz Prize. YALE UNIVERSITY, Dept. of Physics

2006 Anthony D. Stanley Memorial Prize for Excellence in Pure and Applied Mathematics. YALE UNIVERSITY, Dept. of Mathematics

2006 DeForest Prize. YALE UNIVERSITY, Dept. of Mathematics

## Funding

### Ongoing

2017–21 NIH/NIMH R01 (R01MH112746) [LINK]
*Title:* Linking large-scale dysconnectivity in schizophrenia to cortical circuit function at the individual level through computational modeling and multimodal neuroimaging
*Role:* Principal Investigator

2016–21 NIH/NIMH R01 (R01MH112189)
*Title:* Mapping the longitudinal neurobiology of early-course schizophrenia
*Role:* Co-Investigator (PI: Alan Anticevic)

2016–21 NIH/NIMH R01 (R01MH108590)
*Title:* Characterizing schizophrenia progression through multi-modal neuroimaging and computation
*Role:* Co-Investigator (PI: Alan Anticevic)

### Completed

2017–18 BlackThorn Therapeutics (sponsored research project) [LINK]
*Title:* A computational framework relating noninvasive human neuroimaging with gene expression mapping to facilitate drug discovery
*Role:* Principal Investigator

2016–18 BlackThorn Therapeutics (sponsored research project) [LINK]
*Title:* Characterizing the neural mechanisms behind cognitive and motivational deficits in psychiatric disorders
*Role:* Principal Investigator (Co-PI with Alan Anticevic)

2016–18 Yale Center for Clinical Investigation (YCCI) Scholar Award
*Role:* Principal Investigator

### Primary Mentor Role

2017–19 DFG Postdoctoral Fellowship (Germany)
*Role:* Mentor (Awardee: Markus Helmer)

2017–19 NSERC Postgraduate Scholarship (Canada)
*Role:* Mentor (Awardee: Norman Lam)

## Publications

[Google Scholar Profile] (H-index: 20; Citations: > 1,900)

### In Review

43. Fulcher BD, Murray JD, Zerbi V, Wang X-J (In Review)
**Multimodal gradients across mouse cortex**.
*bioRxiv* 10.1101/393215 [DOI]

42. Demirtaş M, Burt JB, Helmer M, Ji JL, Adkinson BD, Glasser MF, Van Essen DC, Sotiropoulos S, Anticevic A, Murray JD (In Review)
**Hierarchical heterogeneity across human cortex shapes large-scale neural dynamics**.
*bioRxiv* 10.1101/341966 [DOI]

41. Lam NH, Borduqui T, Hallak J, Roque AC, Anticevic A, Krystal JH, Wang X-J, Murray JD (In Review)
**Effects of altered excitation-inhibition balance on decision making in a cortical circuit model**.
*bioRxiv* 0.1101/100347 [DOI]

40. Ji JL, Diehl C, Schleifer C, Pearlson GD, Yang GJ, Creatura G, Krystal JH, Repovs G, Murray JD, Winkler AM, Anticevic A (In Review)
**Schizophrenia exhibits bi-directional brain-wide alterations in cortico-striato-cerebellar circuits**.
*bioRxiv* 10.1101/166728 [DOI]

39. Murray JD, Repovs G, Yang GJ, Savic A, Wang X-J, Anticevic A (In Review)
**Neural circuit model for cognition-emotion interactions: affective and task-relevant interference differentially impact working memory**.

## 2018

38. Preller KH, Burt JB, Ji JL, Schleifer C, Adkinson B, Stampfli P, Repovs G, Krystal JH, Murray JD, Vollenweider FX, Anticevic A (2018)
**Changes in global and thalamic brain connectivity in LSD-induced altered states are attributable to the 5-HT2A receptor**.
*eLife* 7:e35082

37. Cho YT, Lam NH, Starc M, Santamauro N, Savic A, Diehl C, Schleifer CH, Repovs G, Murray JD, Anticevic A (2018)
**Effects of reward on spatial working memory in schizophrenia**.
*Journal of Abnormal Psychology* 127:695 [DOI]

36. Murray JD, Demirtaş M, Anticevic A (2018)
**Biophysical modeling of large-scale brain dynamics and applications for computational psychiatry**.
*Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* 3:777 [DOI]

35. Burt JB, Demirtaş M, Eckner WJ, Navejar N, Ji JL, Martin WJ, Bernacchia A, Anticevic A, Murray JD (2018)
**Hierarchy of transcriptomic specialization across human cortex captured by structural neuroimaging topography**.
*Nature Neuroscience* 21:1251 [DOI]

34. Constantinidis C, Funahashi S, Lee D, Murray JD, Qi XL, Wang M, Arnsten AFT (2018)
**Persistent spiking activity underlies working memory**.
*Journal of Neuroscience* 38:7020 [DOI]

33. Murray JD, Wang X-J (2018)
**Cortical circuit models in psychiatry: linking disrupted excitation-inhibition balance to cognitive deficits associated with schizophrenia**.
In: Anticevic A, Murray JD, eds., *Computational Psychiatry: Mathematical Modeling of Mental Illness*. San Diego: Academic Press. [LINK] [PDF]

## 2017

32. Murray JD*, Jaramillo J*, Wang X-J (* denotes equal contribution) (2017)
**Working memory and decision-making in a fronto-parietal circuit model**.
*Journal of Neuroscience* 37:12167 [DOI] [PDF]

31. Yang GJ, Murray JD, Glasser M, Pearlson GD, Krystal JH, Schleifer C, Repovs G, Anticevic A (2017)
**Altered global signal topography in schizophrenia**.
*Cerebral Cortex* 27:5156 [DOI] [PDF]

30. Anticevic A, Murray JD (2017)
**Rebalancing altered computations: considering the role of neural excitation and inhibition balance across the psychiatric spectrum.** (Commentary)
*Biological Psychiatry* 81:816 [DOI] [PDF]

29. Foss-Feig JH, Adkinson BD, Ji JL, Yang GJ, Srihari VH, McPartland JC, Krystal JH, Murray JD, Anticevic A (2017)
**Searching for cross-diagnostic convergence: neural mechanisms governing excitation and inhibition balance in schizophrenia and autism spectrum disorders.**
*Biological Psychiatry* 81:848 [DOI] [PDF]

28. Krystal JH, Anticevic A, Yang GJ, Dragoi G, Driesen NR, Wang X-J, Murray JD (2017)
**Impaired tuning of neural ensembles and the pathophysiology of schizophrenia: a translational and computational neuroscience perspective.**
*Biological Psychiatry* 81:874 [DOI] [PDF]

27. Krystal JH, Murray JD, Chekroud A, Corlett PR, Yang GJ, Wang X-J, Anticevic A (2017)
**Computational psychiatry and the challenge of schizophrenia.** (Commentary)
*Schizophrenia Bulletin* 43:473 [DOI] [PDF]

26. Murray JD, Anticevic (2017)
**Toward understanding thalamo-cortical dysfunction in schizophrenia through computational models of circuit dynamics.**
*Schizophrenia Research* 180:70 [DOI] [PDF]

25. Murray JD*, Anticevic A* (* denotes equal contribution) (2017)
**Computational modeling approaches to psychiatry.**
In: *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*, 10th ed. Philadelphia: Lippincott Williams & Wilkins. [PDF]

24. Starc M*, Murray JD*, Santamauro N, Savic A, Diehl C, Cho YT, Srihari V, Morgan PT, Krystal JH, Wang X-J, Repovs G, Anticevic A (* denotes equal contribution) (2017)
**Schizophrenia is associated with a pattern of spatial working memory deficits consistent with cortical disinhibition.**
*Schizophrenia Research* 181:107 [DOI] [PDF]

23. Murray JD, Bernacchia A, Roy NA, Constantinidis C, Romo R, Wang X-J (2017)
**Stable population coding for working memory coexists with heterogeneous neural dynamics in prefrontal cortex.**
*Proceedings of the National Academy of Sciences* 114:394 [DOI] [PDF]

## 2016

22. Mejias JF, Murray JD, Kennedy H, Wang X-J (2016)
**Feedforward and feedback frequency-dependent interactions in a large-scale laminar network of the primate cortex.**
*Science Advances* 2:e1601335 [DOI] [PDF]

21. Krystal JH, Anticevic A, Murray JD, Glahn DC, Driesen NR, Yang GJ, Wang X-J (2016)
**Clinical heterogeneity arising from categorical and dimensional features of the neurobiology of psychiatric diagnoses: insights from neuroimaging and computational neuroscience**.
In: *Computational Psychiatry: New Perspectives on Mental Illness*, edited by A. D. Redish and J. A. Gordon. Strüngmann Forum Reports, vol. 20, J. Lupp, series editor. Cambridge, MA: MIT Press.
[PDF]

20. Yang GR, Murray JD, Wang X-J (2016)
**A dendritic disinhibitory circuit mechanism for pathway-specific gating**.
*Nature Communications* 7:12815 [DOI] [PDF]

19. Zagha E, Murray JD, McCormick DA (2016)
**Simulating cortical feedback modulation as changes in excitation and inhibition in a cortical circuit model**.
*eNeuro* 3:e0208-16.2016 [DOI] [PDF]

18. Arnsten AFT, Murray JD, Seo H, Lee D (2016)
**Ketamine's antidepressant actions: potential mechanisms in the primate medial prefrontal circuits that represent aversive experience**. (Commentary)
*Biological Psychiatry* 79:713 [DOI] [PDF]

17. Yang GJ, Murray JD, Wang X-J, Glahn DC, Pearlson GD, Repovs G, Krystal JH, Anticevic A (2016)
**Functional hierarchy underlies preferential connectivity disturbances in schizophrenia**.
*Proceedings of the National Academy of Sciences* 112:E219 [DOI] [PDF]

16. Cole MW, Yang GJ, Murray JD, Repovs G, Anticevic A (2016)
**Functional connectivity change as shared signal dynamics**.
*Journal of Neuroscience Methods* 259:22 [DOI] [PDF]

## 2015

15. Anticevic A*, Haut K*, Murray JD, Repovs G, Yang GJ, Cole MW, . . ., Cannon TD (* denotes equal contribution) (2015)
**Association of thalamic dysconnectivity and conversion to psychosis in youth and young adults at elevated clinical risk**.
*JAMA Psychiatry* 72:882 [DOI] [PDF]

14. Anticevic A*, Murray JD*, Barch DM (* denotes equal contribution) (2015)
**Bridging levels of understanding in schizophrenia through computational modeling**.
*Clinical Psychological Science* 3:433 [DOI] [PDF]

13. Anticevic A, Corlett PR, Cole MW, Savic A, Gancsos M, Tang Y, Repovs G, Murray JD, Driesen NR, Morgan PT, Xu K, Wang F, Krystal JH (2015)
**N-methyl-D-aspartate receptor antagonist effects on prefrontal cortical connectivity better model early than chronic schizophrenia**.
*Biological Psychiatry* 77:569 [DOI] [PDF]

12. Anticevic A*, Hu X*, Deng W, Hu J, Xiao Y, Li F, Bi F, Cole MW, Savic A, Yang GJ, Repovs G, Murray JD, Wang X-J, Huang X, Lui S*, Krystal JH, Gong Q (* denotes equal contribution) (2015)
**Early-course unmedicated schizophrenia patients exhibit elevated prefrontal connectivity associated with longitudinal change.**
*Journal of Neuroscience* 35:267 [DOI] [PDF]

## 2014

11. Murray JD, Bernacchia A, Freedman DJ, Romo R, Wallis JD, Cai X, Padoa-Schioppa C, Pasternak T, Seo H, Lee D, Wang X-J (2014)
**A hierarchy of intrinsic timescales across primate cortex.**
*Nature Neuroscience* 17:1661 [DOI] [PDF]

10. Anticevic A, Yang GJ, Savic A, Murray JD, Cole MW, Repovs G, Pearlson GD, Glahn DC (2014)
**Mediodorsal and visual thalamic connectivity differ in schizophrenia and bipolar disorder with and without psychosis history.**
*Schizophrenia Bulletin* 40:1227 [DOI] [PDF]

9. Anticevic A, Cole MW, Repovs G, Murray JD, Brumbaugh MS, Winkler AM, Savic A, Krystal JH, Pearlson GD, Glahn DC (2014)
**Characterizing thalamo-cortical disturbances in schizophrenia and bipolar illness.**
*Cerebral Cortex* 24:3116 [DOI] [PDF]

8. Yang GJ*, Murray JD*, Repovs G, Cole MW, Savic A, Glasser MF, Krystal JH, Wang X-J, Pearlson GD, Glahn DC, Anticevic A (* denotes equal contribution) (2014)
**Altered global brain signal in schizophrenia.**
*Proceedings of the National Academy of Sciences* 111:7438 [DOI] [PDF]

7. Murray JD, Anticevic A, Gancsos M, Ichinose M, Corlett PR, Krystal JH, Wang X-J (2014)
**Linking microcircuit dysfunction to cognitive impairment: effects of disinhibition associated with schizophrenia in a cortical working memory model.**
*Cerebral Cortex* 24:859 (Feature Article) [DOI] [PDF]

## 2013

6. Anticevic A, Cole MW, Repovs G, Savic A, Driesen NR, Yang GJ, Cho YT, Murray JD, Glahn DC, Wang X-J, Krystal JH (2013)
**Connectivity, pharmacology and computation: towards a mechanistic understanding of neural system dysfunction in schizophrenia.**
*Frontiers in Psychiatry* 4:169 [DOI] [PDF]

**2012**

5. Anticevic A, Cole MW, Murray JD, Corlett PR, Wang X-J, Krystal JH (2012)
**The role of default network deactivation in cognition and disease**.
*Trends in Cognitive Sciences* 16:584 [DOI] [PDF]

4. Anticevic A, Gancsos M, Murray JD, Repovs G, Driesen NR, Ennis DJ, Niciu MJ, Morgan PT, Smith M, Wang X-J, Krystal JH*, Corlett PR* (2012) (* denotes equal contribution)
**NMDA receptor function in large-scale anticorrelated neural systems with implications for cognition and schizophrenia**.
*Proceedings of the National Academy of Sciences* 109:16720 [DOI] [PDF]

**2011**

3. Murray JD, Ardid S (2011)
**What can tracking the activity of dozens of sensory neurons tell about the source of attention?** (Commentary)
*Frontiers in Systems Neuroscience* 5:35 [DOI] [PDF]

**2008**

2. Jacques V, Murray JD, Marquier F, Chauvat D, Grosshans F, Treussart F, Roch J-F (2008)
**Enhancing single-molecule photostability by optical feedback from quantum jump detection**.
*Applied Physics Letters* 93:203307 [DOI] [PDF]

1. Li D, Dong Y, Ramos RG, Murray JD, Dementyev AE, Barrett SE (2008)
**Intrinsic origin of spin echoes in dipolar solids generated by strong $\pi$-pulses**.
*Physical Review B* 77:214306 [DOI] [PDF]

## Research Software Packages

2018 PsychRNN: https://pypi.org/project/PsychRNN/

2018 PyDDM: https://pypi.org/project/pyddm/

## Selected Invited Seminars & Symposia

Upcoming Whistler Scientific Workshop on Brain Functional Organization, Connectivity, and Behavior. Noosa, Australia. March 10–13, 2019.

Upcoming Stony Brook University. Multi-Modal Translational Imaging Lab Seminar Series. November 29, 2018.

## 2018

10/2018 6th Workshop on the Computational Properties of Prefrontal Cortex (CPPC). Vanderbilt University. Nashville, TN. October 11–14, 2018.

10/2018 Columbia University. Seminar series of the Center for Theoretical Neuroscience. October 5, 2018.

9/2018 SUNY Downstate. Neural & Behavioral Science Seminar Series. September 12, 2018.

9/2018 Conference on Cognitive Computational Neuroscience (CCN). Breakout session on "How can we bring neuroscientific insights into neural network models?". Philadelphia, PA. September 8, 2018.

9/2018 Columbia University. C3N (Computational, Cognitive, and Clinical Neuroscience) Seminar Series. September 5, 2018.

8/2018 Methods in Computational Neuroscience (MCN) course. 30th Anniversary Symposium. Marine Biological Laboratory. Woods Hole, MA. August 23, 2018.

5/2018 Society of Biological Psychiatry meeting. Symposium on "Towards convergent clinical neuroscience: integrating genetics, computation & pharmacological neuroimaging to understand psychosis biomarker mechanisms". New York, NY. May 10, 2018.

3/2018 Computational and Systems Neuroscience (Cosyne) meeting. Workshop on "Circuit dynamics in working memory". Breckenridge, CO. March 5-6, 2018.

1/2018 Latin American School on Computational Neuroscience (LASCON). São Paulo, Brazil. January 22–26, 2018.

## 2017

11/2017 Society for Neuroscience (SfN) annual meeting. Minisymposium on "Computational psychiatry: multiscale models of mental illnesses". Washington, DC. November 11–13, 2017.

10/2017 New York University. Computational Psychiatry Lecture Series. October 25, 2017.

8/2017 WPA World Congress of of Psychiatry. Session on "Philosophy and psychiatry: integrative explanation – from phenomenology to molecules and back". Berlin, Germany, October 8–12, 2017.

5/2017 SIAM Conference on Applications of Dynamical Systems. Minisymposium on "Mathematical modeling in psychiatry". Snowbird, UT. May 21–25, 2017.

5/2017 Society of Biological Psychiatry meeting. Satellite meeting on "Computational psychiatry". San Diego, CA. May 17, 2017.

3/2017 Cognitive Neuroscience Society (CNS) meeting. Symposium on "Working memory: sustained activity or dynamics?". San Francisco, CA. March 25–28, 2017.

**2016**

5/2016 Society of Biological Psychiatry meeting. Symposium on "Computational psychiatry: a bridge across levels of analyses towards high-impact biological psychiatry". Atlanta, GA. May 12–14, 2016.

5/2016 Society of Biological Psychiatry meeting. Symposium on "Computational biomarkers in schizophrenia: leveraging electrophysiology and neuroimaging to validate mechanism". Atlanta, GA. May 12–14, 2016.

1/2016 Latin American School on Computational Neuroscience (LASCON). São Paulo, Brazil. January 18–22, 2016.

**2015**

6/2015 Society of Mathematical Biology annual meeting. Mini-Symposium on "Mathematical modeling in psychiatry". Atlanta, GA. June 30–July 3, 2015.

**2014**

7/2014 Computational Neurosciences (CNS) annual meeting. Workshop on "Large-scale brain structure and dynamics". Québec City, Canada. July 31, 2014.

5/2014 10th International Workshop on Computational Psychiatry. "Omics of schizophrenia – a systematic multi-level view". Ludwig-Maximilians-University, Dept. of Psychiatry and Psychotherapy. Munich, Germany. May 9–10, 2014.

3/2014 Computational and Systems Neuroscience (Cosyne) meeting. Workshop on "Computational psychiatry". Snowbird, UT. March 3–4, 2014.

**2013**

9/2013 Molecular Psychiatry Association annual meeting. Symposium on "Disturbances in glutamate-GABA interactions in local circuits: implications for abnormal functional connectivity in schizophrenia". San Francisco, CA. November 8–10, 2013.

## Teaching & Directorship of Courses

Computational & Cognitive Neuroscience (CCN) Summer School, held in Asia [link]

2015–pres. Co-Director and lecturer.
2010-14 Tutor for first five years of the course.

Latin American School on Computational Neuroscience (LASCON)

2016, 2018 Invited lecturer. Delivered lectures and computational tutorials related to neural circuit modeling and computational psychiatry. January 2016, 2018.

Yale University

2016–18 Guest lecturer in graduate-level course, Methods and Logic in Interdisciplinary Research (MCDB 517). Spring 2016, 2017, 2018.

2017 Guest lecturer in graduate-level neuroscience course, Principles of Neuroscience (NSCI 501). Fall 2017.

2017 Guest lecturer in graduate-level neuroscience course, Data Analysis in Neuroscience (NBIO 599). Spring 2017.

2015 Guest lecturer in graduate-level neuroscience course, Computational Modeling & Analysis in Neuroscience (NSCI 588). Fall 2015.

2013 Certificate of College Teaching Preparation. Participated in teaching workshops focused on pedagogical techniques (over 20 hours) and teaching observation. [link]

## University Service

Yale University

2018–pres. Graduate Admissions Committee, Integrated Graduate Program in Physical and Engineering Biology (PEB), Yale University.

2018–pres. Graduate Admissions Committee, Department of Physics, Yale University.

2018–pres. Member, Yale Center for Biomedical Data Science, Yale University. [link]

2017–pres. Graduate Admissions Committee, Interdepartmental Neuroscience Program, Yale University.

2017–pres. Co-Director, Swartz Center for Theoretical Neuroscience, Yale University. Organization of seminar series and postdoctoral fellowships. [link]

2016–pres. Freshman Adviser, Trumbull College, Yale University.

2015–pres. Fellow of Trumbull College, Yale University.

## Editorial Service

2018–pres. Editorial board, *Neurons, Behavior, Data Analysis, and Theory (NBDT)* [LINK]

2017–pres. Editorial board (Associate Editor), *Journal of Neuroscience* [LINK]

2016–pres. Editorial board (Handling editor), *Computational Psychiatry* [LINK]

2016–17 Co-editor of book: *Computational Psychiatry: Mathematical Modeling of Mental Illness.* Anticevic A, Murray JD, eds. San Diego: Academic Press, 2017 [LINK]

2016–17 *Biological Psychiatry* guest co-editor (with Alan Anticevic) for special issue (May 15, 2017) on "Cortical Excitation-Inhibition Balance and Dysfunction in Psychiatric Disorders" [LINK]

## Ad-Hoc Reviewing

- **Journals** [Publons Profile]: Addiction Biology; Biological Psychiatry; Biological Psychiatry: Cognitive Neuroscience and Neuroimaging; Cerebral Cortex; eLife; Frontiers in Computational Neuroscience; Journal of Cognitive Neuroscience; Journal of Neurophysiology; Journal of Neuroscience (*Outstanding Reviewer, 2017; Frequent Reviewer, 2016*); Journal of Neuroscience Methods; Nature Communications; NeuroImage; Neuroscience; PLoS Biology; PLoS Computational Biology; Proceedings of the National Academy of Sciences; Psychiatry Research: Neuroimaging; Scientific Reports; Schizophrenia Bulletin; Trends in Cognitive Sciences; Vision Research
- **Grants**: Irish Research Council (Laureate Award); Medical Research Council (MRC), United Kingdom; Wellcome Trust (Sir Henry Wellcome Postdoctoral Fellowship, Research Career Development Fellowship)
- **Meeting Abstracts**: Cosyne

## Trainee Advising

### Postdoctoral Researchers

2018–pres. Qinglong Gu (Swartz Fellow, 2018–pres.)

2016–pres. Markus Helmer (Awarded DFG Postdoctoral Fellowship, 2017)

2016–pres. Murat Demirtaş (Swartz Fellow, 2016–18)

2016–17 Julie Goulet (Swartz Fellow, 2016–17)

### Graduate Students

2017–pres. Daming Li (Yale Physics)

2017–pres. Max Shinn (Yale INP)

2016–pres. Daniel Ehrlich (Yale INP)

2016–pres. Norman Lam (Yale Physics) (Awarded NSERC Postgraduate Scholarship, 2017)

2015–pres. Josh Burt (Yale Physics)

**Undergraduate Students**

2018-pres. Amber Hu (Yale undergraduate)

2018-pres. Jasmine Stone (Yale undergraduate)

2018–pres. Lasya Sreepada (Yale undergraduate)

2018-pres. Sungrok Trevor Shim (Yale undergraduate)

2018-pres. Adela DePavia (Yale undergraduate)

2018 Vanessa Achoy (Vassar undergraduate, through NSF REU summer program)

2018 Gonzalo Aguilar (Yale undergraduate, Physics senior thesis project)

2016 Natasha Navejar (Tulane undergraduate, through NSF REU summer program)

2016–18 David Brandfonbrener (Yale undergraduate)

2016–18 Alexander Atanasov (Yale undergraduate)

2016–17 William Eckner (Yale undergraduate) (Awarded Yale College Dean's Research Fellowship, 2016)

## Student Committee Membership

**Ph.D. Thesis Committee**

2018–pres. Jacob Lister (Yale INP)

2017–pres. Juyue Chen (Yale INP)

2017–pres. Jie Lisa Ji (Yale INP)

2016–pres. Brian DeAngelis (Yale INP)

2016–18 Bart Massi (Yale INP)

2015–17 Genevieve Yang (Yale INP)

**Ph.D. Qualifying Exam Committee for Yale Interdepartmental Neuroscience Program (INP)**

2018 Wanyu Lei, Shanna Murray, Hongli Wang, Yixiang Wang

2017 Daniel Barson, Sol Bernardez Sarria, Abigail Greene, Zhicheng George Sun

2016 Jie Lisa Ji, Jacob Lister

## Outreach

2016, 2018 NSF REU mentor (2016, 2018).

2015 TEDxAmherst. Invited speaker. Amherst, MA. April 25, 2015.