

ZHI-DE DENG

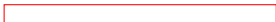





✉ zzzdeng@alum.mit.edu ☎ +1 919 564 5282 🌐 www.zzzdeng.net

EDUCATION	Ph.D., Columbia University Electrical Engineering	2013
	M.Phil., Columbia University Electrical Engineering; graduate concentration in Neuroscience	2011
	M.Eng., Massachusetts Institute of Technology Electrical Engineering & Computer Science	2007
	S.B., Massachusetts Institute of Technology Electrical Science & Engineering	2007
	S.B., Massachusetts Institute of Technology Physics; minor in Economics	2006
ACADEMIC & GOVERNMENT APPOINTMENTS	Senior Associate Scientist (Research Professor equivalent ↗) National Institute of Mental Health Experimental Therapeutics & Pathophysiology Branch	2025 –
	Staff Scientist National Institute of Mental Health Experimental Therapeutics & Pathophysiology Branch Noninvasive Neuromodulation Unit	2019 – 2025
	Adjunct Assistant Professor Duke University School of Medicine Department of Psychiatry & Behavioral Sciences Division of Behavioral Medicine & Neurosciences <i>Faculty Network Member, Duke Institute for Brain Sciences</i>	2016 – 2020
	Medical Instructor Duke University School of Medicine Department of Psychiatry & Behavioral Sciences Division of Brain Stimulation & Neurophysiology	2014 – 2016
RESEARCH PROGRAM LEADERSHIP	Director, Computational Neurostimulation Research Program National Institute of Mental Health Experimental Therapeutics & Pathophysiology Branch Noninvasive Neuromodulation Unit	2019 –
POSTGRADUATE TRAINING & FELLOWSHIP APPOINTMENTS	Research Fellow National Institute of Mental Health Experimental Therapeutics & Pathophysiology Branch Noninvasive Neuromodulation Unit	2016 – 2019
	Postdoctoral Associate Duke University School of Medicine Department of Psychiatry & Behavioral Sciences Division of Brain Stimulation & Neurophysiology	2013 – 2014

PREDOCTORAL RESEARCH ASSISTANTSHIPS & INTERNSHIPS	Visiting Graduate Research Assistant , Duke Psychiatry	2010–2013
	Graduate Research Assistant , Columbia Psychiatry	2007–2010
	Research Assistant , Harvard–MIT Division of Health Sciences & Technology	2005–2007
	Executive Intern , Weill Cornell Medicine Anesthesiology	Summer 2004
	Internship Coordinator , Children’s Aid Society	Summer 2003
	Newsroom Technology Intern , The New York Times Company	Summer 2002
AWARDS & HONORS: INTERNATIONAL & NATIONAL	Certificate for Top Cited Article	2025
	<i>Bipolar Disorders</i> , International Society for Bipolar Disorders/Wiley	
	Elected to Full Membership	2024
	Sigma Xi, The Scientific Research Honor Society	
	Scholar, Advanced Research Institute in Mental Health and Aging	2023–2024
	Dartmouth College, supported by grant from NIH/NIMH R25 MH068502	
	Elevated to Senior Membership	2023
	Institute of Electrical and Electronics Engineers (IEEE)	
	Elected to Associate Membership	2023
	American College of Neuropsychopharmacology	
	New Investigator Award	2018
	American Society of Clinical Psychopharmacology	
	Early Career Investigator Travel Fellowship Award	2018
	Society of Biological Psychiatry	
	Research Colloquium for Junior Investigators	2018
	American Psychiatric Association	
	Alies Muskin Career Development Leadership Program	2018
	Anxiety & Depression Association of America	
	NARSAD Young Investigator Award	2017
Brain & Behavior Research Foundation		
Scholar, Career Development Institute for Psychiatry	2017	
Stanford University/University of Pittsburgh		
New Investigator Award	2017	
International Society for CNS Clinical Trials and Methodology		
Certificate for Highly Cited Research	2016	
<i>Brain Stimulation</i> , Elsevier		
Young Investigator Memorial Travel Award	2015	
American College of Neuropsychopharmacology		
Scholar, Summer Research Institute in Geriatric Mental Health	2015	
Weill Cornell Medical College, supported by NIH/NIMH R25 MH019946		
Chair’s Choice Travel Fellowship Award	2015	
Society of Biological Psychiatry		
Innovative Research Poster Award	2014	
National Network of Depression Centers		
Best Abstract Award	2010	
International Society for Neurostimulation		
New York Times College Scholarship	2002–2006	
The New York Times Company Foundation		

AWARDS & HONORS: INSTITUTIONAL & LOCAL	Special Act Award 2025
	For outstanding scholarship advancing precision neuromodulation, NIMH
	NIMH Director’s Award 2024
	For outstanding transdisciplinary scientific contributions to advance neuromodulation technologies for the study and treatment of psychiatric disorders
	High Five Award 2024
	For excellent preparation for and presentation at the Noninvasive Neuromodulation Unit’s Board of Scientific Counselors review, NIMH
	First Place Winner, Science as Art Competition 2022
	NIMH Intramural Research Program Fellows’ Scientific Training Day
	NIMH Director’s Award 2019
For scientific innovation at the interface of computation and psychiatry	
Richard J. Wyatt Memorial Fellowship Award for Translational Research 2018	
NIMH Intramural Research Program	
KL2 Career Development Award 2014–2016	
Duke Translational Medicine Institute, supported by NIH/NCATS KL2 TR001115	
Presidential Award for Outstanding Teaching, Finalist 2010	
Columbia University	
CTSA T32 Certificate Award 2008–2009	
Columbia University Irving Institute for Clinical and Translational Research, supported by NIH/NCRR TL1 RR024158	

- RESEARCH FOCUS
- ✎ Neurostimulation: Technology development, computational modeling, stimulus parameter and dose optimization, translational and clinical applications
 - ✎ Computational electromagnetics and bioelectricity
 - ✎ Electrophysiological and neuroimaging biomarker development
 - ✎ Nonlinear dynamics of physiological systems


RESEARCH OUTPUT SUMMARY	 72 Refereed original research articles
	 21 Refereed conference proceedings & technical letters
	 19 Refereed reviews, perspectives, protocols, & consensus papers
	 10 Book chapters
	 8 Editorials, commentaries, & correspondence
	 10 IP filings (4 granted U.S. patents, 3 pending, 3 provisionals)
	+ 186 Abstracts


* Denotes first, joint first, or senior author

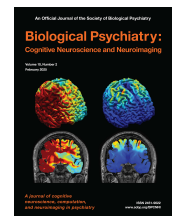
REFEREED ORIGINAL RESEARCH ARTICLES

D. F. Gregory, I. Sun, M. Teferi, H. Gura, M. Patel, A. Casalvera, S. Chandrashekar, K. G. Lynch, D. H. Schultz, A. Jeyapratap, Q. Tate, W. Makhoul, **Z.-D. Deng**, D. J. Oathes, Y. I. Sheline, and N. L. Balderston, “The Philadelphia Theta Burst Project: A novel fMRI-guided electric-field modeling dataset with reliability metrics,” *Imaging Neurosci.*, accepted, Jun. 2026.

L. Beynel, V. Roopchansingh, P. Taylor, R. Reynolds, L. Li, N. Baker, D. Bandy, K. Cameron, **Z.-D. Deng**, E. Ekpo, H. Gura, S. Menon, E. Wiener, Z. Rezaee, J. K. Rajendra, B. Lubner, and S. H. Lisanby, “Feasibility of integrating real-time fMRI neurofeedback with rTMS: Study design, preliminary results, and technical challenges,” *Apert. Neuro*, accepted, Jun. 2026.

Data available 

- * L. Beynel, E. Wiener, N. Baker, E. Greenstein, A. D. Neacsu, E. Jones, B. Gindoff, S. M. Francis, C. Neige, M. Mondino, S. W. Davis, B. Lubner, S. H. Lisanby, and **Z.-D. Deng**, “Noninvasive brain stimulation combined with evidence-based psychotherapy for psychiatric disorders: A meta-analysis of optimal implementation parameters,” *Neurosci. Biobehav. Rev.*, vol. 187, Art. no. 106786, Aug. 2026.
DOI: [10.1016/j.neubiorev.2026.106786](https://doi.org/10.1016/j.neubiorev.2026.106786); PMID: 42214517
- * P. L. Robins, J. R. Gilbert, B. Lubner, N. Mustafa, E. Bharti, J. D. Stout, F. W. Carver, and **Z.-D. Deng**, “Selective modulation of evidence accumulation by hippocampal theta oscillations during mnemonic decision-making,” *Hum. Brain Mapp.*, vol. 47, no. 7, Art. no. e70529, May 2026.
DOI: [10.1002/hbm.70529](https://doi.org/10.1002/hbm.70529); PMID: PMC13122434
- * D. A. Drumm, G. Nuñez Ponasso, A. Linke, S. Ganguly, A. Wang, G. M. Noetscher, B. Maess, T. R. Knösche, J. Haueisen, J. D. Lewine, C. C. Abbott, S. N. Makaroff, and **Z.-D. Deng**, “Improved source localization of auditory evoked fields using reciprocal BEM-FMM,” *Brain Topogr.*, vol. 39, no. 3, Art. no. 39, May 2026.
DOI: [10.1007/s10548-026-01190-x](https://doi.org/10.1007/s10548-026-01190-x); PMID: PMC13035606
- N. Khadka, **Z.-D. Deng**, S. H. Lisanby, M. Bikson, and J. A. Camprodon, “Computational models of high-definition electroconvulsive therapy for focal or multitargeting treatment,” *J. ECT*, vol. 41, no. 4, pp. 223–231, Dec. 2025.
DOI: [10.1097/YCT.0000000000001069](https://doi.org/10.1097/YCT.0000000000001069); PMID: PMC12892304
◆ Featured in Issue Highlights
- E. C. Ekpo, L. Beynel, B. Lubner, **Z.-D. Deng**, T. J. Strauman, and S. H. Lisanby, “Resting-state and task-based functional connectivity reveal distinct mPFC and hippocampal network alterations in major depressive disorder,” *Brain Sci.*, vol. 15, no. 11, Art. no. 1133, Oct. 2025.
DOI: [10.3390/brainsci15111133](https://doi.org/10.3390/brainsci15111133); PMID: PMC12650456; Data available 
📖 Part of Special Issue: *Applications of fMRI in neuropsychiatry and neurological disease* 
- A. V. Peterchev, **Z.-D. Deng**, C. Sikes-Keilp, E. C. Feuer, M. A. Rosa, and S. H. Lisanby, “Optimal frequency for seizure induction with electroconvulsive therapy and magnetic seizure therapy in nonhuman primates,” *Biol. Psychiatry Glob. Open Sci.*, vol. 5, no. 3, Art. no. 100471, May 2025.
DOI: [10.1016/j.bpsgos.2025.100471](https://doi.org/10.1016/j.bpsgos.2025.100471); PMID: PMC11985115; Data available 
- S. M. McClintock, **Z.-D. Deng**, M. M. Husain, V. J. Thakkar, E. Bernhardt, R. D. Weiner, B. Lubner, and S. H. Lisanby, “Comparing the neurocognitive effects of right-unilateral ultra-brief pulse electroconvulsive therapy and magnetic seizure therapy for the treatment of major depressive episode,” *Biol. Psychiatry Cogn. Neurosci. Neuroimaging*, vol. 10, no. 2, pp. 175–185, Feb. 2025.
DOI: [10.1016/j.bpsc.2024.10.016](https://doi.org/10.1016/j.bpsc.2024.10.016); PMID: PMC12923074  Journal cover
📰 Media coverage: *Brain & Behavior Research Foundation*  | *UT Southwestern News Release*, Jan. 2025. 
- Z. Qi, G. M. Noetscher, A. Miles, K. Weise, T. R. Knösche, C. R. Cadman, A. R. Potashinsky, K. Liu, W. A. Wartman, G. Nunez Ponasso, M. Bikson, H. Lu, **Z.-D. Deng**, A. R. Nummenmaa, and S. N. Makaroff, “Enabling electric field model of microscopically realistic brain,” *Brain Stimul.*, vol. 18, no. 1, pp. 77–93, Jan./Feb. 2025.
DOI: [10.1016/j.brs.2024.12.1192](https://doi.org/10.1016/j.brs.2024.12.1192); PMID: PMC11867869; Data available 
📖 Commentary: vol. 18, no. 3, pp. 897–899, May/June 2025.  🗨️ Reply: vol. 18, no. 4, pp. 1150–1152, Jul./Aug. 2025. 
- N. I. Hasan, M. Dannhauer, D. Wang, **Z.-D. Deng**, and L. J. Gomez, “Real-time computation of brain E-field for enhanced transcranial magnetic stimulation neuronavigation and optimization,” *Imaging Neurosci.*, vol. 3, Art. no. imag_a_00412, Jan. 2025.
DOI: [10.1162/imag_a_00412](https://doi.org/10.1162/imag_a_00412); PMID: PMC12319877; Code available 




- 🏆 First Place in Best Student Paper (awarded to N.I. Hasan), *International Applied Computational Electromagnetics Society Symposium*, 2024.
- 🏆 Third Place in Best Student Paper (awarded to N.I. Hasan), *Photonics and Electromagnetics Research Symposium*, 2024.

B. Luber, L. Beynel, **Z.-D. Deng**, L. G. Appelbaum, T. Jones, A. Harrison, D. L. K. Murphy, E. Lo, R. A. McKinley, and S. H. Lisanby, “Site- and frequency-specific enhancement of visual search performance with online individual alpha frequency (IAF) repetitive transcranial magnetic stimulation (rTMS) to the inferior frontal junction,” *Cereb. Cortex*, vol. 34, no. 9, Art. no. bhae371, Sep. 2024.

DOI: 10.1093/cercor/bhae371; PMID: PMC11405677

M. Teferi, H. Gura, M. Patel, A. Casalvera, K. G. Lynch, W. Makhoul, **Z.-D. Deng**, D. J. Oathes, Y. I. Sheline, and N. L. Balderston, “Intermittent theta-burst stimulation to the right dorsolateral prefrontal cortex may increase potentiated startle in healthy individuals,” *Neuropsychopharmacology*, vol. 49, no. 10, pp. 1619–1629, Sep. 2024.

DOI: 10.1038/s41386-024-01871-w; PMID: PMC11319663; Code available 

📖 Commentary: vol. 50, no. 11, pp. 1752–1753, Oct. 2025. 


* M. Dib, J. D. Lewine, C. C. Abbott, and **Z.-D. Deng**, “Electroconvulsive therapy modulates loudness dependence of auditory evoked potentials: A pilot MEG study,” *Front. Psychiatry*, vol. 15, Art. no. 1434434, Aug. 2024.

DOI: 10.3389/fpsy.2024.1434434; PMID: PMC11345267

H. Nguyen, C. Q. Li, S. Hoffman, **Z.-D. Deng**, Y. Yang, and H. Lu, “Ultra-high frequency repetitive TMS at subthreshold intensity induces suprathreshold motor response via temporal summation,” *J. Neural Eng.*, vol. 21, no. 4, Art. no. 046044, Aug. 2024.

DOI: 10.1088/1741-2552/ad692f; PMID: PMC11307324

L. Beynel, H. Gura, Z. Rezaee, E. C. Ekpo, **Z.-D. Deng**, J. O. Joseph, P. Taylor, B. Luber, and S. H. Lisanby, “Lessons learned from an fMRI-guided rTMS study on performance in a numerical Stroop task,” *PLOS ONE*, vol. 19, no. 5, Art. no. e0302660, May 2024.

DOI: 10.1371/journal.pone.0302660; PMID: PMC11073721; Code available 


S. K. Kar, A. Agrawal, A. Silva-dos-Santos, Y. Gupta, and **Z.-D. Deng**, “The efficacy of transcranial magnetic stimulation in the treatment of obsessive-compulsive disorder: An umbrella review of meta-analyses,” *CNS Spectr.*, vol. 29, no. 2, pp. 109–118, Apr. 2024.

DOI: 10.1017/S1092852923006387; PMID: PMC11524532

* B. Kadriu, **Z.-D. Deng**, C. Kraus, J. N. Johnston, A. Figtman, I. D. Henter, S. Kasper, and C. A. Zarate, Jr., “The impact of body mass index on clinical features of bipolar disorder: A STEP-BD study,” *Bipolar Disord.*, vol. 26, no. 2, pp. 160–175, Mar. 2024.


DOI: 10.1111/bdi.13370; PMID: PMC10839568

🏆 Top Cited Article, awarded by Wiley, 2025.

📰 Media coverage: *Psychiatric Times*, Feb. 2024. 

* P. L. Robins, S. N. Makaroff, M. Dib, S. H. Lisanby, and **Z.-D. Deng**, “Electric field characteristics of rotating permanent magnet stimulation,” *Bioengineering*, vol. 11, no. 3, Art. no. 258, Mar. 2024.



DOI: 10.3390/bioengineering11030258; PMID: PMC10968657

📖 Part of Special Issue: *Electric, magnetic, and electromagnetic fields in biology and medicine: From mechanisms to biomedical applications: 2nd edition* 

🏆 Trainee Travel Award (awarded to P. L. Robins), *NIMH Fellows’ Scientific Training Day*, 2023.

* **Z.-D. Deng**, B. Luber, S. M. McClintock, R. D. Weiner, M. M. Husain, and S. H. Lisanby, “Clinical outcomes of magnetic seizure therapy vs electroconvulsive therapy for major depressive episode: A randomized clinical trial,” *JAMA Psychiatry*, vol. 81, no. 3, pp. 240–249, Mar. 2024.

DOI: 10.1001/jamapsychiatry.2023.4599; PMID: PMC10701670

📖 Commentary: vol. 81, no. 7, pp. 736–737, Jul. 2024.  📖 Reply: pp. 737–738. 

📰 Media coverage: *Psychiatric News*, Feb. 2024. [🔗](#) | *MedPage Today*, Feb. 2024. [🔗](#) | *Brain & Behavior Research Foundation*, Jan. 2024. [🔗](#) | *NIMH Research Highlight*, Dec. 2023. [🔗](#)

- * C. C. Abbott, J. Miller, D. Farrar, M. Argyelan, M. Lloyd, T. Squillaci, B. Kimbrell, S. Ryman, T. R. Jones, J. Upston, D. K. Quinn, A. V. Peterchev, E. Erhardt, A. Datta, S. M. McClintock, and **Z.-D. Deng**, “Amplitude-determined seizure-threshold, electric field modeling, and electroconvulsive therapy antidepressant and cognitive outcomes,” *Neuropsychopharmacology*, vol. 49, no. 4, pp. 640–648, Mar. 2024.

DOI: 10.1038/s41386-023-01780-4; PMID: PMC10876627

📄 Research Highlight commentary: pp. 635–636. [🔗](#)

W. A. Wartman, K. Weise, M. Rachh, L. Morales, **Z.-D. Deng**, A. Nummenmaa, and S. N. Makaroff, “An adaptive h-refinement method for the boundary element fast multipole method for quasi-static electromagnetic modeling,” *Phys. Med. Biol.*, vol. 69, no. 5, Art. no. 055030, Feb. 2024.

DOI: 10.1088/1361-6560/ad2638; PMID: PMC10902857; Data available [🔗](#)

📄 Part of Special Issue: *Electromagnetic modeling for brain stimulation* [🔗](#)

🏆 Third Place in International Student Competition (awarded to W. A. Wartman), *Brain & Human Body Modeling Conference*, 2023.

M. Argyelan, **Z.-D. Deng**, O. T. Ousdal, L. Oltedal, B. Angulo, M. Baradits, A. J. Spitzberg, U. Kessler, A. Sartorius, A. Dols, K. L. Narr, R. Espinoza, J. A. van Waarde, I. Tendolkar, P. van Eijndhoven, G. A. van Wingen, A. Takamiya, T. Kishimoto, M. B. Jorgensen, A. Jorgensen, O. B. Paulson, A. Yroni, P. Péran, C. Soriano-Mas, N. Cardoner, M. Cano, L. van Diermen, D. Schrijvers, J.-B. Belge, L. Emsell, F. Bouckaert, M. Vandenbulcke, M. Kiebs, R. Hurlmann, P. C. R. Mulders, R. Redlich, U. Dannlowski, E. Kavakbasi, M. D. Kritzer, K. K. Ellard, J. A. Camprodon, G. Petrides, A. K. Malhotra, and C. C. Abbott, “Electroconvulsive therapy-induced volumetric brain changes converge on a common causal circuit in depression,” *Mol. Psychiatry*, vol. 29, no. 2, pp. 229–237, Feb. 2024.

DOI: 10.1038/s41380-023-02318-2; PMID: PMC11116108; Code available [🔗](#)

S. N. Makaroff, Z. Qi, M. Rachh, W. A. Wartman, K. Weise, G. M. Noetscher, M. Daneshzand, **Z.-D. Deng**, L. Greengard, and A. R. Nummenmaa, “A fast direct solver for surface-based whole-head modeling of transcranial magnetic stimulation,” *Sci. Rep.*, vol. 13, no. 1, Art. no. 18657, Oct. 2023.

DOI: 10.1038/s41598-023-45602-5; PMID: PMC10618282; Code available [🔗](#)

- * **Z.-D. Deng**, P. L. Robins, M. Dannhauer, L. M. Haugen, J. D. Port, and P. E. Croarkin, “Optimizing TMS coil placement approaches for targeting the dorsolateral prefrontal cortex in depressed adolescents: An electric field modeling study,” *Biomedicines*, vol. 11, no. 8, Art. no. 2320, Aug. 2023.

DOI: 10.3390/biomedicines11082320; PMID: PMC10452519

📄 Part of Special Issue: *Emerging trends in brain stimulation* [🔗](#)

🏆 First Place in International Student Competition (awarded to P. L. Robins), *Brain & Human Body Modeling Conference*, 2022.











C. Kraus, A. Kautzky, V. Watzal, A. Gramser, B. Kadriu, **Z.-D. Deng**, L. Bartova, C. A. Zarate, Jr., R. Lanzenberger, D. Souery, S. Montgomery, J. Mendlewicz, J. Zohar, G. Faneli, A. Serretti, and S. Kasper, “Body mass index and clinical outcomes in individuals with major depressive disorder: Finding from the GSRD European Multicenter Database,” *J. Affect. Disord.*, vol. 335, pp. 349–357, Aug. 2023.

DOI: 10.1016/j.jad.2023.05.042; PMID: PMC10502963

M. Teferi, W. Makhoul, **Z.-D. Deng**, D. J. Oathes, Y. Sheline, and N. L. Balderston, “Continuous theta-burst stimulation to the right dorsolateral prefrontal cortex may increase potentiated startle in healthy individuals,” *Biol. Psychiatry Glob. Open Sci.*, vol. 3, no. 3, pp. 470–479, Jul. 2023.

DOI: 10.1016/j.bpsgos.2022.04.001; PMID: PMC10382694

- J. Miller, T. Jones, J. Upston, **Z.-D. Deng**, S. M. McClintock, E. Erhardt, D. Farrar, and C. C. Abbott, “Electric field, ictal theta power, and clinical outcomes in electroconvulsive therapy,” *Biol. Psychiatry Cogn. Neurosci. Neuroimaging*, vol. 8, no. 7, pp. 760–767, Jul. 2023.
DOI: 10.1016/j.bpsc.2023.03.001; PMID: PMC10329999
- A. Guillen, C. C. Abbott, **Z.-D. Deng**, Y. Huang, P. Pascoal-Faria, D. Q. Truong, and A. Datta, “Impact of modeled field of view in electroconvulsive therapy current flow simulations,” *Front. Psychiatry*, vol. 14, Art. no. 1168672, May 2023.
DOI: 10.3389/fpsy.2023.1168672; PMID: PMC10232815
☐ Part of Research Topic: *Translational approaches in neurostimulation research: Challenges and opportunities for neuropsychiatry* ☑
- M. Alawi, P. F. Lee, **Z.-D. Deng**, Y. K. Goh, and P. E. Croarkin, “Modelling the differential effects of age on transcranial magnetic stimulation induced electric fields,” *J. Neural Eng.*, vol. 20, no. 2, Art. no. 026016, Mar. 2023.
DOI: 10.1088/1741-2552/ac9a76; PMID: PMC10278869
- X. Chen, R. Ma, W. Zhang, G. Q. Zeng, Q. Wu, A. Yimiti, X. Xia, J. Cui, Q. Liu, X. Meng, J. Bu, Q. Chen, Y. Pan, N. X. Yu, S. Wang, **Z.-D. Deng**, A. T. Sack, M. McLaughlin, and X. Zhang, “Alpha oscillatory activity is causally linked to working memory retention,” *PLOS Biol.*, vol. 21, no. 2, Art. no. e3001999, Feb. 2023.
DOI: 10.1371/journal.pbio.3001999; PMID: PMC9983870
- Z. Fu, C. C. Abbott, J. Miller, **Z.-D. Deng**, S. M. McClintock, M. S. E. Sendi, J. Sui, and V. D. Calhoun, “Cerebro-cerebellar functional neuroplasticity mediates the effect of electric field on electroconvulsive therapy outcomes,” *Transl. Psychiatry*, vol. 13, no. 1, Art. no. 43, Feb. 2023.
DOI: 10.1038/s41398-023-02312-w; PMID: PMC9902462; Code available ☒
- * S. N. Makaroff, H. Nguyen, Q. Meng, H. Lu, A. R. Nummenmaa, and **Z.-D. Deng**, “Modeling transcranial magnetic stimulation coils with magnetic cores,” *J. Neural Eng.*, vol. 20, no. 1, Art. no. 016028, Jan. 2023.
DOI: 10.1088/1741-2552/acae0d; PMID: PMC10481791; Code available ☒
- S. Qi, V. D. Calhoun, D. Zhang, J. Miller, **Z.-D. Deng**, K. L. Narr, Y. Sheline, S. M. McClintock, R. Jiang, X. Yang, J. Upston, T. Jones, J. Sui, and C. C. Abbott, “Links between electroconvulsive therapy responsive and cognitive impairment multimodal brain networks in late-life major depressive disorder,” *BMC Med.*, vol. 20, no. 1, Art. no. 477, Dec. 2022.
DOI: 10.1186/s12916-022-02678-6; PMID: PMC9733153; Code available ☒
- H. Li, **Z.-D. Deng**, D. Oathes, and Y. Fan, “Computation of transcranial magnetic stimulation electric fields using self-supervised deep learning,” *NeuroImage*, vol. 264, Art. no. 119705, Dec. 2022.
DOI: 10.1016/j.neuroimage.2022.119705; PMID: PMC9854270
- A. Richie-Halford, M. Cieslak, L. Ai, S. Caffarra, S. Covitz, A. R. Franco, I. I. Karipidis, J. Kruper, M. Milham, B. Avelar-Pereira, E. Roy, V. J. Sydnor, J. D. Yeatman, The Fibr Community Science Consortium [including **Z.-D. Deng**], T. D. Satterthwaite, and A. Rokem, “An analysis-ready and quality controlled resource for pediatric brain white-matter research,” *Sci. Data*, vol. 9, no. 1, Art. no. 616, Oct. 2022.
DOI: 10.1038/s41597-022-01695-7; PMID: PMC9556519; Code available ☒ Data available ☒
- J. Miller, T. Jones, J. Upston, **Z.-D. Deng**, S. M. McClintock, S. Ryman, D. Quinn, and C. C. Abbott, “Ictal theta power as an electroconvulsive therapy safety biomarker: A pilot study,” *J. ECT*, vol. 38, no. 2, pp. 88–94, Jun. 2022.
DOI: 10.1097/YCT.0000000000000812; PMID: PMC10680084

- H. Bagherzadeh, Q. Meng, **Z.-D. Deng**, H. Lu, E. Hong, Y. Yang, and F.-S. Choa, “Angle-tuned coils: Attractive building blocks for TMS with improved depth–spread performance,” *J. Neural Eng.*, vol. 19, no. 2, Art. no. 026059, May 2022.
DOI: 10.1088/1741-2552/ac697c; PMID: PMC10644970
- B. Luber, S.W. Davis, **Z.-D. Deng**, D. Murphy, A. Martella, A.V. Peterchev, and S.H. Lisanby, “Using diffusion tensor imaging to effectively target TMS to deep brain structures,” *NeuroImage*, vol. 249, Art. no. 118863, Apr. 2022.
DOI: 10.1016/j.neuroimage.2021.118863; PMID: PMC8851689
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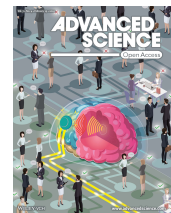
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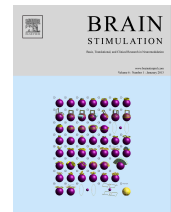
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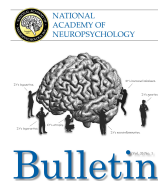
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- * **Z.-D. Deng**, N. M. Arzeno, E. S. Katz, H. Chang, C. L. Marcus, and C.-S. Poon, “Non-high frequency heart rate chaos: A noninvasive marker of REM sleep and obstructive sleep apnea syndrome in children,” *bioRxiv*, Oct. 2018.
DOI: 10.1101/457630

THESES

- * **Z.-D. Deng**, “Electromagnetic Field Modeling of Transcranial Electric and Magnetic Stimulation: Targeting, Individualization, and Safety of Convulsive and Subconvulsive Applications,” Ph.D. dissertation, Department of Electrical Engineering, Columbia University, New York, NY, 2013. Sponsor: K. L. Shepard.
Available: *Columbia University Academic Commons*, DOI: 10.7916/D8F47WCS
- * **Z.-D. Deng**, “Stochastic Chaos and Thermodynamic Phase Transitions: Theory and Bayesian Estimation Algorithms,” M.Eng. thesis, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, 2007. Sponsor: C.-S. Poon.
Available: *DSpace@MIT*, HDL: 1721.1/41649

📍 Denotes oral presentation

ABSTRACTS
(SELECTED,
2025–2026)

- * E. Bharti, C. A. Zarate, Jr., V. Voon, and **Z.-D. Deng**, “Personalizing treatment: Ethical considerations of machine learning with neuroimaging for depression,” *Postgraduate Bioethics Conference, University of Warwick*, Sep. 2026.
- D. Tang, C. Swenson, S. Small-Zlochower, **Z.-D. Deng**, and S. Makaroff, “Design of a multi-channel low-intensity TMS array,” *NYC Neuromodulation Conference*, Jul./Aug. 2026.
- S. B. S. Larsen, S. Makaroff, D. Tang, **Z.-D. Deng**, R. Ludwig, G. Noetscher, P. Kølbaek, R. E. Nielsen, and G. Bizik, “Transcranial pulsed electromagnetic fields (T-PEMF) for difficult-to-treat bipolar depression: Treatment outcomes, safety, and tolerability from a naturalistic cohort,” *NYC Neuromodulation Conference*, Jul./Aug. 2026.
- D. Tang, G. Bizik, **Z.-D. Deng**, R. Ludwig, G. Noetscher, and S. Makaroff, “Electric and magnetic field characteristics of the Re5 brain stimulation system,” *NYC Neuromodulation Conference*, Jul./Aug. 2026.
- * J. R. Gilbert, C. A. Zarate, Jr., and **Z.-D. Deng**, “Frontocingulate oscillatory and circuit-level dynamics shape ketamine efficacy in treatment-resistant depression,” *Biol. Psychiatry*, vol. 99, no. 10, p. S311, May 2026.
- * S. Dey and **Z.-D. Deng**, “Closed-loop neuromodulation through the lens of direct and indirect data-driven control,” *Biol. Psychiatry*, vol. 99, no. 10, p. S307, May 2026; also presented at *NIMH IRP Fellows’ Scientific Training Day*, Sep. 2025.
- N. Baker, L. Beynel, **Z.-D. Deng**, B. Luber, T. Strauman, and S. H. Lisanby, “Clinical changes following concurrent fMRI-guided rTMS and psychotherapy for patients with treatment-resistant depression,” *Biol. Psychiatry*, vol. 99, no. 10, pp. S162–S163, May 2026.
- * **Z.-D. Deng**, C. A. Zarate, Jr., and J. R. Gilbert, “Frontocingulate gamma power and connectivity as biomarkers of ketamine response in treatment-resistant depression,” *Neuropsychopharmacology*, vol. 51, suppl. 1, p. 128, Jan. 2026.
📍 Accepted for presentation, unable to attend conference due to government travel restrictions
- C. N. Bakir, I. Azamet, L. Sangster-Carrasco, K. Delaney, M. Dib, **Z.-D. Deng**, and P. E. Croarkin, “Comparison of two motor threshold determination methods in adolescents undergoing treatment with transcranial magnetic stimulation,” *J. Am. Acad. Child Adolesc. Psychiatry*, vol. 64, no. 10, p. S332, Oct. 2025.
- 📍 L. Beynel, V. Roopchansingh, R. Reynolds, P. A. Taylor, **Z.-D. Deng**, L. Li, N. Baker, D. Bandy, K. Cameron, H. Gura, E. Ekpo, S. Menon, E. Wiener, J. K. Rajendra, B. Luber, and S. H. Lisanby, “Using real-time fMRI neurofeedback to control brain state during rTMS: A proof-of-concept study,” *International Workshop on Concurrent TMS/fMRI*, Sep. 2025.
📍 Accepted for presentation, unable to attend conference due to government travel restrictions
- L. D. Oliver, J. Jeyachandra, E. W. Dickie, C. Hawco, S. Mansour, S. M. Hare, R. W. Buchanan, A. K. Malhotra, D. M. Blumberger, **Z.-D. Deng**, and A. N. Voineskos, “Individualized transcranial magnetic stimulation targeting using Bayesian Optimization Of NeuroStimulation (BOONStim),” *University of Toronto Department of Psychiatry Research Day*, Jun. 2025.
- B. H. Chandler, D. K. Greenstein, K. T. Hurst, L. R. Waldman, C. A. Zarate, Jr., **Z.-D. Deng**, and E. D. Ballard, “Tracking affective correlates of ketamine response in treatment-resistant depression,” *NIH Postbac Poster Day*, May 2025.
- L. Oliver, D. Blumberger, C. Hawco, E. Dickie, J. Gallucci, J. Jeyachandra, S. Mansour, **Z.-D. Deng**, S. Hare, J. Gold, G. Foussias, M. Argyelan, Z. Daskalakis, R. Buchanan, A. Malhotra, and A. Voineskos, “Individualized transcranial magnetic stimulation targeting social cognitive network functional connectivity in schizophrenia spectrum disorders,” *Biol. Psychiatry*, vol. 97, no. 9, p. S48, May 2025.

- * E. Wiener, L. Beynel, N. Baker, E. Greenstein, A. D. Neacsu, E. Jones, B. Gindoff, S. M. Francis, C. Neige, S. W. Davis, B. Luber, S. H. Lisanby, and **Z.-D. Deng**, “Efficacy of non-invasive brain stimulation combined with evidence-based psychotherapy for psychiatric disorders: A meta-analysis,” *Annual Meeting of the Social and Affective Neuroscience Society*, Apr. 2025.
- B. H. Chandler, D. K. Greenstein, K. T. Hurst, L. R. Waldman, C. A. Zarate, Jr., **Z.-D. Deng**, and E. D. Ballard, “Exploring facial emotional expression as a biomarker for depression severity and treatment response,” *Washington Psychiatric Society Spring Presidential Symposium and Gala*, Apr. 2025.
 ✂ Accepted for presentation, unable to attend conference due to government travel restrictions
- C. Reid, S. Francis, E. Bharti, E. Greenstein, Z. Rezaee, B. Luber, **Z.-D. Deng**, C. Zrenner, and S. H. Lisanby, “Phase-triggered TMS using real-time mu rhythm EEG to enhance paired associative stimulation,” *Washington Psychiatric Society Spring Presidential Symposium and Gala*, Apr. 2025.
 ✂ Accepted for presentation, unable to attend conference due to government travel restrictions
- L. Beynel, V. Roopchansingh, R. Reynolds, P. A. Taylor, **Z.-D. Deng**, L. Li, N. Baker, D. Bandy, K. Cameron, H. Gura, E. Ekpo, S. Menon, E. Wiener, Z. Rezaee, J. K. Rajendra, B. Luber, and S. H. Lisanby, “A journey towards an objective control of brain state: Concurrent rTMS during real time fMRI neurofeedback,” *International Society for CNS Clinical Trials and Methodology Annual Scientific Meeting*, Feb. 2025.
 ✂ Accepted for presentation, unable to attend conference due to government travel restrictions
- ✂ S. Francis, Z. Rezaee, C. Reid, E. Bharti, M. Jaime, E. Greenstein, **Z.-D. Deng**, B. Luber, C. Zrenner, and S. H. Lisanby, “Enhancing TMS response through real-time EEG-triggered paired associative stimulation of mu rhythm,” *International Brain Stimulation Conference*, Feb. 2025.
 ✂ Accepted for presentation, unable to attend conference due to government travel restrictions
- ✂ N. I. Hasan, M. Dannhauer, D. Wang, **Z.-D. Deng**, and L. J. Gomez, “Real-time computation of E-Field in transcranial magnetic stimulation for neuronavigation and optimization,” *Brain Stimul.*, vol. 18, no. 1, pp. 575–576, Jan./Feb. 2025; also in *Photonics and Electromagnetics Research Symposium*, Apr. 2024.
 🏆 Third Place in Best Student Paper (awarded to N. I. Hasan), *Photonics and Electromagnetics Research Symposium*, Apr. 2024.
- D. Tang, W. Wartman, A. Nummenmaa, M. Daneshzand, G. Noetscher, H. Lu, **Z.-D. Deng**, and S. N. Makaroff, “A BEM-FMM TMS coil designer using MATLAB platform,” *Brain Stimul.*, vol. 18, no. 1, p. 428, Jan./Feb. 2025; also presented at *NYC Neuromodulation Conference*, Aug. 2024.
- * **Z.-D. Deng**, “Multichannel Individualized Stimulation Therapy (MIST): A targeted approach to optimize electroconvulsive therapy,” *Brain Stimul.*, vol. 18, no. 1, p. 346, Jan./Feb. 2025.
 ✂ Accepted for presentation, unable to attend conference due to government travel restrictions
- Z. Qi, G. Noetscher, A. Miles, K. Weise, T. Knösche; C. Cadman, A. Potashinsky, K. Liu, W. Wartman, G. Ponasso, M. Bikson, H. Lu, **Z.-D. Deng**, A. Nummenmaa, and S. Makaroff, “Why and how do microscopic field perturbations lower activating thresholds?” *Brain Stimul.*, vol. 18, no. 1, p. 217, Jan./Feb. 2025.

INTELLECTUAL
PROPERTY

D. Tang, G. Bizik, L. Christensen, **Z.-D. Deng**, R. Ludwig, G. Noetscher, G. Nuñez Ponasso, and S. Makaroff, “Neuromodulation device and system,” U.S. Provisional Patent Application 64/063,720, filed on May 12, 2026.

Z.-D. Deng, J. Kim, G. R. Dold, B. A. Pritchard, R. H. Schor, and S. H. Lisanby, “Systems and methods for adjustable current individualized stimulation therapy,” International Patent Application WO 2025/254758 A1, Dec. 11, 2025. Assignee: National Institutes of Health, U.S. Department of Health and Human Services. ☑

Z.-D. Deng, B. A. Pritchard, J. Kim, G. R. Dold, R. H. Schor, and S. H. Lisanby, “Systems and methods for multichannel individualized stimulation therapy,” International Patent Application WO 2024/215761 A1, Oct. 17, 2024. Assignee: National Institutes of Health, U.S. Department of Health and Human Services. ☑

☞ National-stage applications pending in US (Application 19/474,167, filed on Oct. 9, 2025) and Europe (Application 2024723369, Feb. 18, 2026)

C. C. Abbott, **Z.-D. Deng**, J. Upston, T. Jones, and A. Datta, “Systems and methods for electroconvulsive therapy,” International Patent Application WO 2024/148196 A1, Jul. 11, 2024. Assignee: University of New Mexico. ☑

☞ National-stage application pending in US (Application 2026/0027375 A1, Jan. 29, 2026)

C. C. Abbott, A. Datta, J. Upston, T. Jones, and **Z.-D. Deng**, “Systems and methods for amplitude-determined seizure titrations and electric field modeling in electroconvulsive therapy,” U.S. Provisional Patent Application 63/516,371, filed on Jul. 28, 2023.

S. N. Makarov, G. M. Noetscher, V. S. Makarov, and **Z.-D. Deng**, “Whole body non-contact electrical stimulation device with variable parameters,” U.S. Patent 10,551,449 B2, Feb. 4, 2020. Assignee: NEVA Electromagnetics, LLC. ☑

C.-S. Poon and **Z.-D. Deng**, “Systems and methods for detecting a physiological abnormality in a patient by using cardiac or other chaos in combination with non-increasing parasympathetic modulation,” U.S. Patent 9,737,258 B2, Aug. 22, 2017. Assignee: Massachusetts Institute of Technology. ☑

A. V. Peterchev, S. H. Lisanby, and **Z.-D. Deng**, “Methods, apparatus, and systems for magnetic stimulation,” U.S. Patent 9,295,853 B2, Mar. 29, 2016. Assignee: The Trustees of Columbia University in the City of New York. ☑

A. V. Peterchev, S. H. Lisanby, and **Z.-D. Deng**, “Methods, apparatus, and systems for magnetic stimulation,” U.S. Patent 8,801,589 B2, Aug. 12, 2014. Assignee: The Trustees of Columbia University in the City of New York. ☑

A. V. Peterchev and **Z.-D. Deng**, “Transcranial magnetic stimulation coil with electronically switchable active and sham modes,” U.S. Provisional Patent Application 61/525,922, filed on Aug. 22, 2011.

ONGOING
RESEARCH
SUPPORT

ADEPT: Adaptive trial for the treatment of depressive symptoms associated with concussion using repetitive transcranial magnetic stimulation protocols

Congressionally Directed Medical Research Programs Award TP220072 2024.12–2026.12

Role: Intramural NIH collaborator; PI: D. L. Brody

This study aims to compare TMS protocols that may alleviate depressive symptoms in US military service members with a history of concussion/mild traumatic brain injury.

Charge-based brain modeling engine with boundary element fast multipole method

NIH/NIMH R01 MH130490

2023.07–2028.05

Role: Intramural NIH collaborator; PI: S. N. Makaroff

This project seeks to create a new brain modeling engine that employs boundary element and fast multipole methods to achieve superior spatial resolution and accuracy in electro-magnetic modeling.

	<i>Novel electric-field modeling approach to quantify changes in resting state functional connectivity following theta burst stimulation</i>	
	NIH/NIMH U01 MH130447	2022.09 – 2027.06
	Role: Intramural NIH collaborator; PI: N. L. Balderston	
	This study aims to develop a model using whole-brain estimates of the TMS-induced electric field to predict changes in resting state functional connectivity following neuro-modulatory TMS, and validate this model in a large cohort of healthy volunteers receiving multiple doses of either intermittent or continuous theta burst stimulation.	
	<i>Deciphering mechanisms of ECT outcomes and adverse effects (DECODE)</i>	
	NIH/NIMH R01 MH128686/MH128690/MH128691/MH128692	2022.08 – 2027.05
	Role: Intramural NIH collaborator; mPIs: Sheline, Narr, Espinoza, McClintock, Abbott	
	This multi-site prospective study aims to study the mechanism of ECT-induced anti-depressant benefits and cognitive adverse effects to determine optimal ECT dose.	
PENDING RESEARCH SUPPORT	<i>Use of transcranial pulsed electromagnetic field (T-PEMF) therapy for bipolar depression: A randomized double-blind sham-controlled parallel-group multicenter trial</i>	
	Independent Research Fund Denmark	2026.06
	Role: Intramural NIH collaborator; mPIs: P. Kølbaek, G. Bizik	
	<i>Neurocircuit-informed non-invasive neuromodulation to treat irritability in adults with major depressive disorder</i>	
	NIH/NIMH R61/R33	2026.06
	Role: Intramural NIH collaborator; mPIs: V. R. Steele, M. K. Jha, W.-L. Tseng	
	<i>A dense low-power TMS array enabling whole-cortex steerable neuromodulation</i>	
	NIH/NIMH PF5	2026.05
	Role: Intramural NIH collaborator; PI: S. N. Makaroff	
	<i>Individualized ECT electrode placement to improve clinical outcomes in older adults</i>	
	NIH/NIMH R61/R33	2026.02
	Role: mPI; collaborating PIs: C. C. Abbott, A. Datta	
	<i>Accelerated intermittent theta burst for methamphetamine use disorder</i>	
	NIH/NIMH R61/R33	2026.02
	Role: Intramural NIH collaborator; mPIs: M. K. Jha, H. Ekhtiari, K. Brady, A. Datta	
	<i>Analysis of two 1-mm³ cortical brain samples with boundary element fast multipole method to better understand brain stimulation</i>	
	NIH R01	2025.12
	Role: Intramural NIH collaborator; PI: S. N. Makaroff	
	<i>PRecision Optimally Targeted ECT (PROTECT) First in Human</i>	
	NIH/NIMH UG3/UH3	2025.09
	Role: mPI; collaborating PIs: C. C. Abbott, A. Datta	
	<i>High-density theta burst stimulation at 100 Hz: Development and first trial in cocaine use disorder</i>	
	NIH UG3/UH3	2025.09
	Role: Intramural NIH collaborator; PI: H. Lu	
	<i>PRecision Optimally Targeted ECT (PROTECT)</i>	
	NIH/NIMH R01	2025.06
	Role: mPI; collaborating PIs: C. C. Abbott, A. Datta	
	<i>Transdiagnostic trial to reduce default mode network connectivity in bipolar depression and major depressive disorder with accelerated iTBS</i>	
	NIH	2025.06
	Role: Intramural NIH collaborator; PI: Y. I. Sheline	

COMPLETED
RESEARCH
SUPPORT

- ECT amplitude titration for improved clinical outcomes in late-life depression*
NIH/NIMH R61/R33 MH125126 2021.02 – 2026.01
Role: Intramural NIH collaborator; PI: C. C. Abbott
This study uses titrated amplitude ECT, individualized based on seizure threshold, to improve clinical response while minimizing cognitive impairment in geriatric depression.
- Neuromodulation of social cognitive circuitry in people with schizophrenia spectrum disorders*
NIH/NIMH R61/R33 MH120188 2020.05 – 2023.04
Role: Intramural NIH collaborator; mPIs: A. N. Voineskos, D. M. Blumberger
This study uses advanced brain imaging, and compare different brain stimulation techniques, to determine whether targeting the dorsomedial prefrontal cortex can engage social cognitive brain circuitry in people with schizophrenia spectrum disorders.
- ECT pulse amplitude and medial temporal lobe engagement*
NIH/NINDS U01 MH111826 2016.09 – 2020.07
Role: Co-I; PI: C. C. Abbott
This study explores the impact of targeted hippocampal engagement with varying levels of electroconvulsive therapy current amplitude in elderly patients with clinical, neuropsychological and neuroimaging assessments.
- Individualized low amplitude seizure therapy (iLAST)*
Brain & Behavior Research Foundation Young Investigator Award 26161 2018.06 – 2020.06
Role: PI
This study aims to develop a novel form of seizure therapy for depression that avoids the neurocognitive side effects of electroconvulsive therapy by using computational modeling to direct multi-electrode configurations that provide targeted and individualized dosing.
- Fast-Fail Trials: Mood and Anxiety Spectrum Disorders (FAST-MAS)*
NIMH 271201200006I-3-27100003-1 2016.06 – 2017.12
Role: Data analyst; PI: A. D. Krystal
The goal of this project is to establish the kappa opiate receptor occupancy and mu opiate receptor effects after two weeks of daily dosing with the investigational agent LY2456302, which has been demonstrated to be a selective kappa opiate receptor antagonist.
- Transcranial direct current stimulation as a treatment for acute fear*
NIH/NIMH R21 MH106772 2015.04 – 2017.01
Role: Co-I; PI: A. D. Krystal
This study investigates the utility of transcranial direct current stimulation to engage a target neural circuit, which could serve as the basis for developing better therapies for those suffering from acute fear related difficulties.
- Individualized optimally-targeted seizure therapy*
NIH/NCATS KL2 TR001115 2014.07 – 2016.06
Role: PI; Training Grant PI: R. M. Califf
This award from the Duke Translational Medicine Institute prepares the fellow for a successful career as a multidisciplinary independent researcher. The goal of the project is to develop a novel individualized neurotargeted seizure therapy.
- Safety and feasibility of low amplitude electroconvulsive therapy*
Duke University School of Medicine, Pilot fund 2015.03 – 2016.06
Role: PI
This study evaluates whether neurocognitive side effects of electroconvulsive therapy can be improved by reducing the current pulse amplitude.
- Prolonging Remission In Depressed Elderly (PRIDE)*
NIH/NIMH U01 MH084241 2009.04 – 2016.03
Role: Data analyst; PI: S. H. Lisanby
This study evaluates the efficacy and neurocognitive effects of combined electroconvulsive and pharmacotherapy in prolonging remission in elderly patients with major depression.

- Low field magnetic stimulation coil design*
 Tal Medical 2015.04 – 2016.06
 Role: Co-I; PI: A. V. Peterchev
 This project develops a novel coil system for low field magnetic stimulation.
- Concurrent cognitive behavioral therapy and transcranial magnetic stimulation in obsessive-compulsive disorder*
 American Psychiatric Association Research Scholarship 2015.11 – 2016.06
 Role: Acting PI; Grantee: Y. Hu
 The purpose of this pilot study is to evaluate the feasibility of repetitive transcranial magnetic stimulation of the supplementary motor area concurrently with elements of exposure and response prevention in patients with obsessive-compulsive disorder.
- Evoked potentials as markers of ketamine-induced cortical plasticity in patients with major depressive disorder*
 Janssen Research & Development, LLC 2014.01 – 2015.12
 Role: Co-I; PI: A. D. Krystal
 This open-label trial evaluates the utility of somatosensory, motor, and transcranial magnetic stimulation-based evoked potentials as markers of cortical plasticity in response to a single intravenous infusion of ketamine in patients with depression.
- Translational research evaluating neurocognitive memory processes*
 NIH/NIMH K23MH087739 2013.07 – 2014.06
 Role: Postdoctoral fellow; PI: S. M. McClintock
 This study informs the cognitive component processes underlying memory impairment after electroconvulsive therapy.
- Magnetic seizure therapy for the treatment of depression*
 Stanley Medical Research Institute 2005.07 – 2011.07
 Role: Postdoctoral fellow; PI: S. H. Lisanby
 This two-center, randomized, double-blind controlled trial compares the antidepressant efficacy and side effects of magnetic seizure therapy and electroconvulsive therapy.
- Rational dosing for electric and magnetic seizure therapy*
 NIH/NIMH R01MH091083 2010.07 – 2015.12
 Role: Graduate research assistant, contributed to grant writing; PI: S. H. Lisanby
 This study aims to optimize stimulus parameters of electric and magnetic seizure therapy through computational modeling and preclinical studies of seizure induction.
- Field shaping and coil design for transcranial magnetic stimulation*
 NIH/NCCR TL1RR024158 2008.07 – 2009.06
 Role: PI; Training Grant PI: H. N. Ginsberg
 This award from the Columbia University Irving Institute for Clinical and Translational Research supports clinical research training for predoctoral students in the basic sciences. The goal of the project is to develop novel coil design for transcranial magnetic stimulation.
- Development of a novel TMS device with controllable pulse shape*
 NIH/NIBIB R21EB006855 2007.08 – 2008.06
 Role: Graduate research assistant; PI: A. V. Peterchev
 This project develops an efficient transcranial magnetic stimulation device that produces nearly rectangular pulses with adjustable amplitude, width, and directionality.
- Nonlinear analysis of heart rate variability*
 NIH/NHLBI R01HL079503 2005.11 – 2007.05
 Role: Graduate research assistant; PI: C.-S. Poon
 This project develops advanced nonlinear estimation and adaptive control algorithms for the modeling and analysis of the cardiovascular system.

PROFESSIONAL PRESENTATIONS SUMMARY	<input type="text"/>	30	Invited seminars
	<input type="text"/>	18	Invited symposia, webinars, & workshops
	<input type="text"/>	7	Grand rounds
	<input type="text"/>	25	Invited conference panels
	<input type="text"/>	10	Contributed conference presentations

⌘ Denotes Continuing Medical Education accredited presentation

INVITED SEMINARS	UCSD, Department of Psychiatry, Interventional Psychiatry Research Program <i>Computational neuroengineering for precision neuromodulation: Dose, device, and treatment optimization</i>	2026
	⌘ The Ohio State University College of Medicine Center for Neuroimaging, Neurophenotyping, Neurocomputation, and Neuromodulation <i>Computational design of next-generation neurostimulation therapies</i>	2025
	UC Irvine, Department of Biomedical Engineering <i>Computational neuroengineering for precision psychiatry: Brain stimulation modeling, dosing, and device innovation</i>	2025
	Arizona State University, School for Biological and Health Systems Engineering <i>Model-driven neurostimulation: Computational approaches to device and dose optimization</i>	2025
	NIMH Intramural Research Program Investigators' Seminar <i>Reading tells: Using facial expression analysis to track emotional states in depression</i>	2025
	Virginia Commonwealth University, Department of Mechanical & Nuclear Engineering Co-hosted by IEEE Magnetics and EMBS Chapters <i>Recent advances in transcranial magnetic stimulation: Devices, modeling, and applications</i>	2025
	UT Southwestern, Department of Psychiatry <i>From models to medicine: Advancing precision neuromodulation through engineering</i>	2025
	UCSF, Department of Psychiatry & Behavioral Sciences <i>Engineering precision in neuromodulation: Computational models to clinical applications</i>	2025
	University of Pittsburgh, Geriatric Psychiatry Neuroimaging Laboratory <i>The full spectrum: Electromagnetic brain stimulation from minimal to maximal intensity</i>	2024
	UT Southwestern, Center for Depression Research and Clinical Care <i>Advancements in computational neurostimulation for depression treatment optimization and technology development</i>	2023
	University of Pittsburgh, Department of Psychiatry <i>Computational neurostimulation: Treatment optimization and technology development</i>	2023
	Global ECT-MRI Collaboration Young Researchers Collective <i>ECT, electric field, neuroplasticity, and clinical outcomes</i>	2022
	National Center of Neuromodulation for Rehabilitation, MUSC <i>Model-driven design for brain stimulation therapies</i> 	2022
	NIMH Intramural Research Program Investigators' Seminar <i>Seizure therapies: The next generation</i>	2022
	Brown University/Butler Hospital, Department of Psychiatry & Human Behavior <i>Computational model driven design for brain stimulation</i>	2021
	University of Pennsylvania, Center for Neuromodulation in Depression and Stress <i>Electromagnetic brain stimulation from low to high intensity</i> 	2021
	VA Boston Healthcare System, Boston University School of Medicine Harvard Medical School Neuropsychiatry Translational Research Fellowship Seminar <i>Precision neurostimulation: History, physics, computational modeling, and engineering</i>	2020

	Medical University of Vienna, Neuroimaging Lab <i>Precision seizure therapy</i>	2020
	Mount Sinai Icahn School of Medicine, Depression and Anxiety Center <i>Rational design of individualized noninvasive brain stimulation</i>	2019
	NIMH Intramural Research Program Investigators' Seminar <i>Computational neurostimulation: Engineering better brain stimulation therapies</i>	2018
	UCLA Brain Mapping Center <i>Computational neurostimulation: Engineering better brain stimulation therapies</i>	2018
	UCLA Semel Institute for Neuroscience and Human Behavior Neuromodulation Division <i>Modeling and design for magnetic stimulation</i>	2018
	USC Mark and Mary Stevens Neuroimaging and Informatics Institute <i>Computational neurostimulation</i>	2018
	NIDA, Neuroimaging Research Branch <i>Advances in transcranial magnetic stimulation technology</i>	2016
	Mayo Clinic College of Medicine, Department of Molecular Pharmacology Neurobiology of Alcoholism and Drug Addiction Lab <i>Transcranial magnetic stimulation technology development</i>	2016
	Mayo Clinic College of Medicine, Department of Neurologic Surgery Neural Engineering Lab <i>Optimizing transcranial magnetic stimulation</i>	2016
	NIMH, Experimental Therapeutics & Pathophysiology Branch <i>Engineering better electromagnetic brain stimulation therapies</i>	2016
	Duke University School of Medicine, Department of Psychiatry & Behavioral Sciences Chair's round: <i>Fundamentals of transcranial electric and magnetic stimulation dosing</i>	2015
	Weill Cornell Medical College, Department of Biomedical Engineering <i>Transcranial magnetic stimulation: Pulse source, coil design, & concurrent neuroimaging</i>	2015
	Duke University, Department of Biomedical Engineering <i>Modeling and coil design considerations for transcranial magnetic stimulation</i>	2014
INVITED SYMPOSIA, WEBINARS, & WORKSHOPS	OHBM Annual Meeting <i>Individualized head modeling and electric field simulation in tDCS, ECT, and TMS: Current and emerging approaches</i> Educational course: Using neuroimaging to inform brain stimulation (TES, TMS, tFUS)	2026
	⌘ Clinical TMS Society Annual Meeting Plenary: <i>From physics to practice: Understanding electric field modeling in clinical TMS</i>	2026
	⌘ International Society for ECT and Neurostimulation Webinar <i>Advancing ECT through computational modeling, dose optimization, and device innovation</i>	2025
	International Symposium on Novel Neuromodulation Techniques <i>Model-driven brain stimulation treatments</i>	2024
	IEEE Brain Discovery & Neurotechnology Workshop, University of Illinois Chicago <i>A model-driven approach to personalized neuromodulation treatment</i>	2024
	NIMH Workshop on The Placebo Effect: Key Questions for Translational Research <i>Challenges and strategies in implementing effective sham stimulation for noninvasive brain stimulation trials</i> 	2024
	Brain and Human Body Modeling Conference <i>Effects of low intensity magnetic stimulation</i>	2023



	International Network of tES–fMRI Webinar <i>Electric field modeling and optimization approaches for individualized targeting</i>	2022
	International College of Neuropsychopharmacology Virtual World Congress <i>Next generation seizure therapy and neuromodulation</i>	2021
	Society for Brain Mapping & Therapeutics Annual Congress <i>Advances in electroconvulsive therapy for treatment of depression</i>	2021
	University of Minnesota Non-Invasive Brain Stimulation Workshop <i>Use of individual electric field models in clinical research</i> 	2020
	International Symposium on Advancing Stimulation Precision Medicine of Brain Disorders, Copenhagen University Hospital Hvidovre, Danish Research Centre for Magnetic Resonance <i>Rational design of precision seizure therapy</i>	2019
	Bergen Workshop of the Global ECT–MRI Collaboration <i>Electric field modeling for electroconvulsive therapy</i>	2018
	Neuropsychiatric Drug Development Summit <i>Targeted intermittent device delivered interventions will ultimately prove superior to maintenance treatment with drugs for brain disorders</i>	2018
	Joint NYC Neuromodulation Conference & NANS Summer Series <i>Overview of electric field modeling</i> Preconference workshop: Computational modeling in neuromodulation	2018
	NYC Neuromodulation Conference <i>Low field magnetic stimulation</i>	2017
	NIMH Non-Invasive Brain Stimulation Electric Field Modeling Workshop <i>Use of individual electric field models in clinical research</i> 	2017
	NIMH Workshop on Transcranial Electrical Stimulation: Mechanisms, Technology, and Therapeutic Applications <i>Effect of anatomical variability on electric field characteristics of tES</i>	2016
	⌘ International Society for ECT and Neurostimulation Annual Meeting Workshop: <i>Spatial targeting with transcranial magnetic stimulation</i>	2015
GRAND ROUNDS	⌘ Barrow Neurological Institute, Phoenix, AZ <i>Innovating neurostimulation: From treatment optimization to next-generation technology</i>	2025
	Advanced Research Institute Grand Rounds in Mental Health and Aging Research <i>Advancing neurostimulation treatment optimization and technology innovation</i>	2023
	Westmead Hospital, Sydney, Australia <i>Advances in neuromodulation: Electroconvulsive therapy</i>	2020
	⌘ Clinical TMS Society <i>Transcranial magnetic stimulation: Physics, devices, and modeling</i>	2018
	⌘ University of New Mexico, Department of Psychiatry & Behavioral Sciences <i>Toward individualized electroconvulsive therapy for treatment of depression</i>	2017
	⌘ Central Regional Hospital, Butner, NC <i>Individualized seizure therapy</i>	2015
	⌘ Duke University School of Medicine, Department of Psychiatry & Behavioral Sciences <i>Toward next generation seizure therapy</i>	2015
INVITED CONFERENCE PANELS	⌘ International College of Neuropsychopharmacology Congress <i>Next-generation seizure therapy: Balancing efficacy and cognition with optimized waveforms and personalized targeting</i> Symposium: <i>Precision neuromodulation to improve treatment outcomes in mood disorders & OCD</i>	2026

Electroconvulsive Therapy Conference & GEMRIC Workshop	2025
<i>ECT time machine: What yesterday's devices teach about tomorrow's therapy</i>	
Panel: <i>Therapeutic components of ECT: Electric field</i>	
⌘ American Neuropsychiatric Association Annual Meeting	2025
<i>Advancing personalized seizure therapy: Magnetic seizure therapy and Multichannel Individualized Stimulation Therapy</i>	
Symposium: <i>Interventional neuropsychiatry: From mechanisms to clinical decision making</i>	
International Brain Stimulation Conference	2025
<i>Multichannel Individualized Stimulation Therapy: A targeted approach to optimize ECT</i>	
Symposium: <i>ECT reimaged: Precision, prediction, and personalized care</i>	
✂ Accepted for presentation, unable to attend due to government travel restrictions	
International Society for Magnetic Resonance in Medicine Annual Meeting	2024
<i>TMS devices and modeling</i>	
Workshop: <i>From basics to applications: MRI of neuromodulation using TMS and FUS</i>	
International Conference of the IEEE Engineering in Medicine and Biology Society	2023
<i>Modeling of TMS and ECT in the treatment of depression</i>	
Panel: <i>Computational analysis of non-invasive neuromodulation constructs: Brain & spine</i>	
⌘ ADAA Anxiety and Depression Conference	2023
<i>Modeling and dose optimization for TMS and ECT</i>	
Panel: <i>Parsing through syndromic heterogeneity in youths with mental illness to identify neurocircuit mechanisms and develop novel treatments</i>	
⌘ International Society for Magnetic Resonance in Medicine	2022
<i>Modeling of TMS</i> 📧	
Workshop: <i>MRI of neuromodulation: Target engagement, neural mechanism, & biomarker development</i>	
Bergen Workshop of the Global ECT–MRI Collaboration	2022
<i>ECT device development</i> 📧	
Panel: <i>Dosing strategies and future of neurostimulation techniques in ECT</i>	
Brain and Human Body Modeling Conference	2022
<i>ECT, electric field, neuroplasticity, and clinical outcomes</i>	
Panel: <i>Modeling of transcranial electrical stimulation and deep brain stimulation</i>	
European Conference of Brain Stimulation in Psychiatry	2022
<i>Symptom dimensions and response trajectories in ECT and MST</i>	
Panel: <i>Beyond clinical syndromes: Understanding mechanisms of neuromodulation from a dimensional perspective</i>	
⌘ Society of Biological Psychiatry Annual Meeting	2022
<i>Depressive symptom dimensions in seizure therapy</i>	
Panel: <i>Dimensional approaches to device neuromodulation</i>	
⌘ American Academy of Child and Adolescent Psychiatry Annual Meeting	2021
<i>Introduction to computational psychiatry</i>	
Panel: <i>Recent work with contemporary computational methods and artificial intelligence to advance the practice of child and adolescent psychiatry</i>	
European College of Neuropsychopharmacology Congress	2021
<i>Precision neurostimulation: Electroconvulsive therapy</i>	
Panel: <i>Neurobiology of rapid mood changes</i>	
European Conference of Brain Stimulation in Psychiatry	2020
<i>Electric field modeling to inform ECT dosing and device development</i>	
Panel: <i>What can we learn from ECT: Insights from the GEMRIC consortium</i>	
NYC Neuromodulation Online	2020
Discussant, <i>Noninvasive vagus nerve stimulation applied to stress management, opioid with-</i>	

drawal, and neurocognitive disorders

	American Society of Clinical Psychopharmacology Annual Meeting <i>Advancing seizure therapy: Rational design for precision outcomes</i> Panel: <i>New developments in neurostimulation</i>	2020
	☞ Accepted for presentation; conference was canceled due to COVID-19 pandemic	
☞	American College of Neuropsychopharmacology Annual Meeting <i>Rational design of precision seizure therapy</i> Panel: <i>Precision neurostimulation for treatment of psychiatric disorders</i>	2019
	International College of Neuropsychopharmacology International Meeting <i>Individualized seizure therapy: Reinventing ECT</i> Workshop: <i>Neurobiological and clinical characterization, and treatment development for treatment resistant depression</i>	2019
	International Brain Stimulation Conference <i>Individualized electroconvulsive therapy for treatment of depression</i> Panel: <i>Individualized brain stimulation: Addressing heterogeneity across modalities</i>	2019
	Joint NYC Neuromodulation Conference & NANS Summer Series <i>High-density ECT: Optimizing stimulation arrays and high-density EEG for brain targeting</i> Panel: <i>New targets and technology of electroconvulsive therapy</i>	2018
	International Conference of the IEEE Engineering in Medicine and Biology Society <i>Electric field induced by TMS: Applications in depression and anxiety</i> Panel: <i>Computational human models for brain stimulation</i>	2018
☞	American Psychiatric Association Annual Conference <i>Individualized neurotargeted seizure therapy: Reinventing ECT</i> Presidential Symposium: <i>ECT in the era of new brain stimulation treatments</i>	2018
☞	ADAA Anxiety and Depression Conference <i>Individualized neurotargeted seizure therapy: Reinventing ECT</i> Panel: <i>Personalized medicine for treatment resistant depressed patients: Novel strategies to optimize treatment with antidepressant medications, ketamine, and ECT</i>	2018
CONTRIBUTED CONFERENCE PRESENTATIONS	International Conference of the IEEE Engineering in Medicine and Biology Society <i>Assessing ultra-low-field MRI-derived head models for electric field simulation in TMS, ECT, and tDCS: Within-subject agreement with 3 T</i>	2026
	Duke CTSA KL2 Symposium <i>Computational modeling in electroconvulsive therapy</i>	2016
	Duke CTSA KL2 Symposium <i>Reengineering electroconvulsive therapy</i>	2015
	International Conference of the IEEE Engineering in Medicine and Biology Society - <i>TMS in the presence of deep brain stimulation implants: Induced electrode currents</i> - <i>ECT in the presence of deep brain stimulation implants: Electric field effects</i>	2010
	Annual National Predoctoral Clinical Research Training Program Meeting <i>Coil design for deep-brain transcranial magnetic stimulation</i>	2009
	TRANSFORM Research Day, Irving Institute for Clinical and Translational Research <i>Electromagnetic field shaping and coil design for transcranial brain stimulation</i>	2009
	International Conference of the IEEE Engineering in Medicine and Biology Society <i>Coil design considerations for deep brain transcranial magnetic stimulation</i>	2008
	Annual Meeting of the Society for Neuroscience <i>Heart rate variability is more chaotic in REM than NREM sleep in children</i>	2006
	International Conference of the IEEE Engineering in Medicine and Biology Society <i>Heart rate variability in pediatric obstructive sleep apnea</i>	2006


TEACHING &
MENTORING
APPOINTMENTS

Guest Lecturer, NIH		
National Institute of Mental Health		
<i>Basic Training Course on Transcranial Magnetic Stimulation</i> 		2020
<i>fMRI Summer Course</i> 		2017
National Institute of Neurological Disorders and Stroke		
<i>Clinical Neuroscience Program Lecture Series</i>		2017, 2019
Research Mentor, University of Maryland, College Park		2018–2019
Fischell Department of Bioengineering		
Faculty, Duke University		
Department of Psychology & Neuroscience		
<i>Research Independent Study</i>		2016
Matching Undergraduates to Science and Engineering Research Program		2015–2016
Biosciences Collaborative for Research Engagement		2015–2016
Department Psychiatry & Behavioral Sciences		
⌘ <i>Visiting Fellowship in Electroconvulsive Therapy</i>		2015
⌘ <i>Visiting Fellowship in Transcranial Magnetic Stimulation</i>		2014–2016
Teaching Assistant, Columbia University		
Department of Electrical Engineering		
<i>Analog Systems in VLSI</i> (graduate level; 33 students + 1 auditor)		Spring 2010
<i>The Digital Information Age</i> (25 students + 2 auditors)		Fall 2009
Recitation Instructor, Columbia University Mailman School of Public Health		
Department of Biostatistics		
<i>Biostatistics</i> (graduate level; 26 students + 1 auditor)		Fall 2009
Teaching Assistant, MIT		
Concourse Program		
<i>Multivariable Calculus</i>		Fall 2003–2006
<i>Differential Equations</i>		Spring 2004–2007

MENTORING
SUMMARY

	5 Faculty
	2 Research fellows & postdoctoral fellows
	1 Sponsored thesis
	4 Thesis examination committees
	4 Graduate students
	6 Post-baccalaureate trainees
	12 Undergraduate students
	4 Interns

FACULTY
ADVISORY
(CO-MENTOR,
NIH K
AWARD)

D. C. Farrar, M.D., Ph.D., University of New Mexico School of Medicine	2025–
“CEASE-LD: Characterizing brain excitability, adequacy of seizures, and efficacy in late-life depression with ECT”	
S. K. Conroy, M.D., Ph.D., Indiana University School of Medicine	2024–
“Targeting negative self-referential processing in depression with transcranial magnetic stimulation”	
S. M. Hare, Ph.D., University of Maryland School of Medicine	
NIH/NIMH K01 MH133116	2024–2029
“Cognitive and neural correlates of TMS motor intracortical inhibition in schizophrenia”	
S. H. Siddiqi, M.D., Brigham & Women’s Hospital	
NIH/NIMH K23 MH121657	2020–2025
“Personalized circuit-based neuromodulation targets for depression”	
 Klerman Prize for Exceptional Clinical Research, <i>Brain & Behavior Research Foundation</i> , 2022.	

	N. L. Balderston, Ph.D., NIMH / University of Pennsylvania Perelman School of Medicine NIH/NIMH K01 MH121777 “Examining the mechanisms of anxiety regulation using a novel, sham-controlled, fMRI-guided rTMS protocol and a translational laboratory model of anxiety” 🏆 Klerman Prize for Exceptional Clinical Research, <i>Brain & Behavior Research Foundation</i> , 2021.	2019 – 2023
RESEARCH FELLOWS & POSTDOCS	S. Dey, Ph.D., NIMH Visiting Postdoctoral Fellow Career progression: Postdoctoral Fellow, Evolutionary Genomics Research Group, National Center for Biotechnology Information, National Library of Medicine, NIH	2024 – 2026
	M. Dannhauer, Ph.D., NIMH Research Fellow Career progression: Assistant Professor, Computer Science, East Carolina University	2022 – 2024
SPONSORED THESES	G. Asturias, Psychology & Neuroscience, Duke University B.S. honors thesis: “Effect of repetitive transcranial magnetic stimulation on the structural and functional connectome in patients with major depressive disorder.” Available: <i>DukeSpace</i> , HDL: 10161/14299 🏆 Graduated with Distinction Career progression: Medical student, Stanford University School of Medicine	2015 – 2017
THESIS EXAMINATION COMMITTEES	D. Tang, Electrical & Computer Engineering, Worcester Polytechnic Institute - Ph.D. thesis committee - M.S. thesis: “Computational and experimental approaches to brain stimulation: TMS simulation, coil measurement, and neural structure analysis.” Sponsor: S. N. Makaroff. Available: <i>Digital WPI</i> , URL: https://digital.wpi.edu/show/6h440x853	2026 –
	S. J. Bolland, Biomedical Engineering, University of Western Australia Ph.D. dissertation: “A comparative study of transcranial magnetic stimulation induced electrical field distributions in neural tissue: A translational pipeline for finite element method analysis using MRI modalities.” Sponsor: J. Rodger. Available: <i>UWA Research Repository</i> , DOI: 10.26182/7vvg-p536	2025
	W. A. Wartman, Electrical & Computer Engineering, Worcester Polytechnic Institute Ph.D. dissertation: “Adaptive mesh refinement for quasistatic electromagnetic modeling of brain stimulation and recording methods.” Sponsor: S. N. Makaroff. Available: <i>Digital WPI</i> , URL: https://digital.wpi.edu/show/sq87c029w	2024
	D. Q. Troung, Biomedical Engineering, CUNY City College Ph.D. dissertation: “Translational modeling of non-invasive electrical stimulation.” Sponsor: M. Bikson. Available: <i>CUNY Academic Works</i> , URL: https://academicworks.cuny.edu/cc_etds_theses/774	2019
GRADUATE STUDENTS	E. Makaroff, M.S. student, Bioethics, Harvard Medical School Capstone project	2026 –
	J. David, Ph.D. candidate, Neuroscience, University of New Mexico “Effects of electric pulse-shape and neuroanatomy on motor threshold” Co-mentor (F31 NRSA, submitted 2026). Primary mentor: Prof. Christopher Abbott (University of New Mexico)	2026 –
	E. Bharti, Ph.D. candidate, NIH–Cambridge Scholars Program Co-advised with Prof. Valerie Voon (University of Cambridge)	2024 –
	M. Kshirsagar, M.S. student, Biomedical Engineering, Duke University Career progression: Consultant, Deloitte Consulting	2012
POSTBACS	P. L. Robins, B.A., NIMH Intramural Research Training Award (IRTA) Fellow 🏆 Trainee Travel Award, NIMH Intramural Research Program, 2023. 🏆 First Place in Student Competition, <i>Brain & Human Body Modeling Conference</i> , 2022. Career progression: Lead interventional technician, Columbia Mental Health	2021 – 2024
	M. R. Hynd, B.S., NIMH IRTA Fellow	2020 – 2022

	Career progression: Ph.D. student, University of North Carolina at Chapel Hill	
	S. Awasthi, B.S., NIMH IRTA Fellow Career progression: Medical student, Stanford University School of Medicine	2018 – 2020
	M. M. Noh, S.B., NIMH IRTA Fellow Career progression: Medical student, University of Cincinnati College of Medicine	2018 – 2019
	J. Thomas, M.S., NIMH IRTA Fellow Career progression: Program officer, National Academies of Sciences, Engineering, & Medicine	2017 – 2019
	M. Velez Afanador, B.S., NIMH IRTA Fellow 🏆 Outstanding Poster Award, <i>NIH Postbac Poster Day</i> , 2018. Career progression: Medical student, Howard University College of Medicine	2016 – 2019
UNDERGRADS	M. Dib, Biomedical Engineering, University of Maryland, College Park NIH summer intern (2017); continued undergraduate mentorship through senior capstone design project: <i>Detection of brain-to-brain synchrony for improved psychotherapy</i> Career progression: Medical student, Weill Cornell Medicine	2017 – 2019
	D. T. Weaver, Biology, Duke University Career progression: M.D./Ph.D. student, Case Western Reserve University	2016
	E. F. Salgado, Psychology & Neuroscience, Duke University 🏆 Graduated with Distinction Career progression: Ph.D. student, Indiana University–Purdue University Indianapolis	2016
	Z. Feng, Biomedical Engineering and Biology, Duke University Career progression: Medical student, University of Colorado School of Medicine	2015 – 2016
	M. L. Glidewell, Biomedical Engineering, Duke University Career progression: Senior strategy consultant, IBM	2015 – 2016
	W. Lim, Biomedical Engineering, Duke University Career progression: Medical student, Texas A&M College of Medicine	2015 – 2016
	F. M. Mercer, Gender, Sexuality and Feminist Studies, Duke University Career progression: Analyst, Morgan Stanley	2015 – 2016
	E. Shinder, Biology, Duke University 🏆 Graduated with Distinction Career progression: Medical student, Stony Brook School of Medicine	2015 – 2016
	E. P. Vienneau, Biomedical Engineering, Duke University 🏆 Howard G. Clark Award for Excellence in Research Career progression: Ph.D. student, Vanderbilt University	2015 – 2016
	S. H. Lee, Biomedical Engineering, Duke University Career progression: Manager, Strategy & Operations, Tempus Labs	2015
	R. Shah, Psychology & Neuroscience, Duke University Career progression: Medical student, Yale School of Medicine	2015
	J. R. Lilien, Electrical & Computer Engineering, Duke University 🏆 Walter J. Seeley Scholastic Award Career progression: Machine learning engineer, Amazon	2014 – 2016
INTERNS	E. Chung, Psychology, University of Maryland, College Park Career progression: Medical student, Touro University Nevada	2017
	A. L. Halberstadt, Biology and Psychology, Carnegie Mellon University Career progression: Ph.D. student, Penn State University	Summer 2017
	C. M. Prevost, Biomedical Engineering, Clemson University Career progression: Medical student, University South Carolina School of Medicine Greenville	Summer 2015

J. V. McCall, Biomedical Engineering, North Carolina State University Summer 2013
 Career progression: Ph.D. student, North Carolina State University

PROFESSIONAL SOCIETIES MEMBERSHIP	<p>Institute of Electrical and Electronics Engineers (IEEE) Senior Member (2023–), Member (2013–2023), Student Member (2004–2013) Engineering in Medicine and Biology Society 2004– Brain Technical Community 2025–</p> <p>American College of Neuropsychopharmacology, Associate Member 2023– Biomedical Engineering Society, Member 2021– American Society of Clinical Psychopharmacology, Member 2019–</p> <p><i>Past memberships:</i> Anxiety and Depression Association of America, Member 2017–2018 International Society for CNS Clinical Trials and Methodology, Member 2017–2019 Organization for Human Brain Mapping, Member 2014–2019 Society for Industrial and Applied Mathematics, Student Member 2008–2012 Society for Neuroscience, Student Member 2005–2012 American Physical Society, Student Member 2004–2009</p>
PROFESSIONAL SERVICE & ADVISORY ROLES	<p>American College of Neuropsychopharmacology Program Committee 2026– Mentor, Travel Award Program 2026 Mentee: Y. Lee, Ph.D., National Institute of Mental Health</p> <p>Advisory Board, Center for Multiscale Bioelectromagnetic Studies of the Brain 2025– Department of Electrical & Computer Engineering, Worcester Polytechnic Institute</p> <p>Board Member, The Global ECT–MRI Research Collaboration (GEMRIC) 2025– Data Processing and MRI Working Group</p> <p>Biomedical Engineering Society Awards Committee 2025–2028 Mid-Career Award Subcommittee 2025 Reviewer, Chapter Development Report 2025</p> <p>American Society of Clinical Psychopharmacology Early Career Committee 2023– Technology Committee 2023– Technology Task Force 2020–2023 Mentor, New Investigator Award Program 2019 Mentee: J.P. Stange, Ph.D., University of Illinois</p> <p>Co-founder & Scientific Advisor, Singula Institute 2017–2025</p>
INSTITUTIONAL SERVICE	<p>Reviewer, NIH Intramural AIDS Research Fellowships 2025 Judge, NIH Fellows Award for Research Excellence Competition 2025 Educational Counselor, MIT 2022–2025 NIH Research Workforce Diversity and Equity Outreach Special Interest Group 2023–2025 Judge, NIMH Training Day Three-Minute Talks competition 2022 Judge/Lead Judge, NIH Postbac Poster Day 2017–2025 NIH Noninvasive Brain Stimulation Special Interest Group 2017–2025</p>

GRANT REVIEW	Reviewer, University of Ottawa Institute of Mental Health Research at The Royal University Medical Research Fund	2026
	Remote Referee, European Research Council	2026
	Technical Reviewer, NIH BluePrint MedTech Program	2021 – 2025
	Expert Reviewer, UK Research and Innovation	2025
	Reviewer, NIH Center for Scientific Review Biophysics of Neural Systems Study Section	2021.10
	Reviewer, Duke Institute for Brain Sciences, Research Incubator Awards	2018, 2021
	EDITORIAL ROLES	Editorial Board Member, <i>Brain Stimulation</i>
Deputy Editor, <i>Transcranial Magnetic Stimulation</i>		2024 –
Associate Editor, <i>Frontiers in Psychiatry</i> Sections: Neurostimulation, Neuroimaging		2022 –
Co-Editor on Research Topic: <i>How does brain stimulation work? Neuroversion and other putative mechanisms of action</i> ☑		2024
Community Reviewer (formerly Review Editor), <i>Frontiers in Psychology</i> Sections: Addictive Behaviors, Consciousness Research		2022 –
Review Editor, <i>Frontiers in Psychiatry</i> Sections: Neurostimulation, Neuroimaging		2016 – 2022
Guest Associate Editor, <i>Frontiers in Pharmacology: Neuropharmacology</i> Co-Editor on Research Topic: <i>Neurobiology of rapid mood changes</i> ☑		2020
Guest Editor, <i>Physics in Medicine & Biology</i> Special Issue: <i>Electromagnetic modeling for brain stimulation</i> ☑		2024
<i>Ad hoc</i> journal reviewer		2010 –
<i>Acta Psychiatrica Scandinavica</i>		
<i>AIP Advances</i>		
<i>American Journal of Psychiatry</i>		
<i>Asian Journal of Psychiatry</i>		
<i>Australasian Physical and Engineering Sciences in Medicine</i>		
<i>Bioelectromagnetics</i>		
<i>Biological Psychiatry</i>		
<i>Biological Psychiatry: Global Open Science</i>		
<i>BioMedical Engineering OnLine</i>		
<i>Biomedical Signal Processing and Control</i>		
<i>Biomedicines</i>		
<i>BMJ Mental Health</i>		
<i>Brain Research Bulletin</i>		
<i>Brain Sciences</i>		
<i>Brain Stimulation</i>		
<i>Cerebral Cortex</i>		
<i>Chaos, Solitons & Fractals</i>		
<i>Clinical EEG and Neuroscience</i>		
<i>Clinical Neurophysiology</i>		
<i>CNS Spectrums</i>		
<i>Computational and Mathematical Methods in Medicine</i>		
<i>Computer Methods and Programs in Biomedicine</i>		
<i>Computer Methods in Biomechanics and Biomedical Engineering</i>		
<i>Cortex</i>		
<i>Depression and Anxiety</i>		

Epilepsy & Behavior Reports
European Psychiatry
Frontiers in Cell and Developmental Biology
Frontiers in Computational Neuroscience
Frontiers in Medicine: Intensive Care Medicine and Anesthesiology
Frontiers in Neurology: Applied Neuroimaging
Frontiers in Neuroscience: Brain Imaging Methods
IEEE Access
IEEE Antennas and Propagation Magazine
IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Neural Systems & Rehabilitation Engineering
IEEE Transactions on Magnetics
Imaging Neuroscience
Journal of Affective Disorders
Journal of ECT
Journal of Neural Engineering
Journal of Neuroscience Methods
Journal of Psychiatric Research
JoVE
Lancet Psychiatry
Medical & Biological Engineering & Computing
Medical Hypotheses
Molecular Psychiatry
Nature Mental Health
Nature Protocols
NeuroImage
NeuroImage Clinical
Neuromodulation
Neuroscience Letters
PLOS Computational Biology
PLOS ONE
Psychological Medicine
Scientific Reports
Translational Psychiatry

Reviewer, conference proceedings and abstracts 2008–

Biomedical Engineering Society Annual Meeting
 IEEE EMBS International Conference on Biomedical and Health Informatics
 IEEE EMBS International Conference on Neural Engineering
 International Conference of the IEEE Engineering in Medicine and Biology Society
 Organization for Human Brain Mapping Annual Meeting

CONFERENCE
 & WORKSHOP
 ORGANIZATION

American Society of Clinical Psychopharmacology Annual Meeting 2023, 2026
 Program review subcommittee

Brain and Human Body Modeling Conference 2023
 Organizing committee, and judge in student competition
 Chair of panel: *New modeling methods: Spinal cord stimulation and novel stimulation*
 Chair of panel: *Development and assessment of modeling methods*

International Brain Stimulation Conference 2023
 Chair of symposium: *Insights and challenges in preclinical models of TMS: Multimodal investigations across animal species*
 Chair of symposium: *Advanced computational modeling and optimization methods for non-invasive brain stimulation*

	Bergen Workshop of the Global ECT–MRI Collaboration Chair of panel: <i>Dosing strategies and future of neurostimulation techniques in ECT</i>	2022
	International Congress of Clinical Neurophysiology Chair of panel: <i>Towards optimized TMS targeting approaches</i>	2022
	Brain and Human Body Modeling Conference Organizing committee Chair of panel: <i>Modeling of transcranial electrical stimulation and deep brain stimulation</i>	2022
	NIH Workshop on TMS–EEG Methodology and Data Integration Organizer and funding applicant ☞ Funding awarded; event was canceled due to COVID-19 pandemic	2020
	American Society of Clinical Psychopharmacology Annual Meeting Chair of panel: <i>Treatment-resistant mood disorders across the lifespan: Novel therapeutics</i>	2019
	International Conference of the IEEE Engineering in Medicine and Biology Society Chair of panel: <i>Computational human models for brain stimulation</i>	2018
	Joint NYC Neuromodulation Conference & NANS Summer Series Director of preconference workshop: <i>Computational modeling in neuromodulation: Tools for engineers, clinicians, and researchers</i>	2018
COMMUNITY INVOLVEMENT, OUTREACH, & SCIENCE ADVOCACY	Producer, <i>Psychopharm Today</i> podcast 🎙️ Hosted by the American Society of Clinical Psychopharmacology	2024–
	ASCP Early Career Workshop 🎤 Presentation: <i>Engaging presentation strategies for any audience</i>	2021
	Mental Health Association of Maryland Presentation: <i>Fundamentals of transcranial brain stimulation</i>	2020
	Jewish Social Service Agency Presentation: <i>Basics of brain stimulation devices: What are they and how do they work</i>	2020
	Exhibitor, USA Science & Engineering Festival ☞ Event was canceled due to COVID-19 pandemic	2020
	University of Pennsylvania, Wharton Undergraduate Health Care Club Presentation: <i>Research in mental health treatment</i>	2019
	Judge, MIT Hacking Medicine: DC Grand Hack	2019
	NIH High School Scientific Training and Enrichment Program Presentation: <i>Bioelectricity and brain stimulation</i>	2019
	NIH Take Your Child to Work Day Presentation: <i>How to fool your brain</i>	2019
	UCLA, CruX Neurotech Organization Presentation: <i>Neuromodulation in psychiatry</i>	2019
	University of Pennsylvania, Wharton Undergraduate Health Care Club Presentation: <i>Technology and the future of mental health treatment</i>	2018
	Innovation Leader, Psychiatry Innovation Lab, American Psychiatric Association	2016
	Duke Translational Medicine Institute, Undergraduate Research Society Presentation: <i>Engineering meets psychiatry</i>	2016
	Duke Psychiatry, Mood Disorders Support and Education Group Presentation: <i>Brain stimulation treatments for severe mood disorders</i>	2016
	Presentation: <i>New frontiers in treatments for mood disorders</i>	2015

PROFESSIONAL DEVELOPMENT & CONTINUING EDUCATION	Mid-Level Leadership Program, NIH	2023
	Structural Equation Modeling, CenterStat by Curran-Bauer Analytics	2022
	Diversity and Inclusion Certificate Program, NIH	2021 – 2022
	FSL Course, University of Oxford FMRIB Analysis Group	2020
	Non-Invasive Transcranial Brain Stimulation Course	2019
	Danish Research Centre for Magnetic Resonance, Copenhagen University Hospital Hvidovre	
	AFNI+SUMA Training Workshop, NIH	2018
	Health Disparities Research Curriculum, Duke Translational Medicine Institute	2015 – 2016
	Tackling the Challenges of Big Data, MIT Professional Education Program	2015
	Clinical Research Training Program, Duke University	2014 – 2015
	Transcranial magnetic stimulation administration certified	2009
	Columbia University Medical Center/New York State Psychiatric Institute	
	Basic Life Support, American Heart Association	Recertified 2023.07

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