

# ZHI-DE DENG

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

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

AWARDS & HONORS: INSTITUTIONAL & LOCAL	<b>Special Act Award</b> <span style="float: right;">2025</span>
	For outstanding scholarship advancing precision neuromodulation, NIMH
	<b>NIMH Director’s Award</b> <span style="float: right;">2024</span>
	For outstanding transdisciplinary scientific contributions to advance neuromodulation technologies for the study and treatment of psychiatric disorders
	<b>High Five Award</b> <span style="float: right;">2024</span>
	For excellent preparation for and presentation at the Noninvasive Neuromodulation Unit’s Board of Scientific Counselors review, NIMH
	<b>First Place Winner, Science as Art Competition</b> <span style="float: right;">2022</span>
	NIMH Intramural Research Program Fellows’ Scientific Training Day
	<b>NIMH Director’s Award</b> <span style="float: right;">2019</span>
For scientific innovation at the interface of computation and psychiatry	
<b>Richard J. Wyatt Memorial Fellowship Award for Translational Research</b> <span style="float: right;">2018</span>	
NIMH Intramural Research Program	
<b>KL2 Career Development Award</b> <span style="float: right;">2014–2016</span>	
Duke Translational Medicine Institute, supported by NIH/NCATS KL2 TR001115	
<b>Presidential Award for Outstanding Teaching, Finalist</b> <span style="float: right;">2010</span>	
Columbia University	
<b>CTSA T32 Certificate Award</b> <span style="float: right;">2008–2009</span>	
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	<input type="text" value="67"/>	67 Refereed original research articles
	<input type="text" value="19"/>	19 Refereed conference proceedings & technical letters
	<input type="text" value="18"/>	18 Refereed reviews, perspectives, protocols, & consensus papers
	<input type="text" value="10"/>	10 Book chapters
	<input type="text" value="8"/>	8 Editorials, commentaries, & correspondence
	<input type="text" value="9"/>	9 IP filings (4 granted U.S. patents, 3 pending, 2 provisionals)
	+ <b>183</b> Abstracts	

\* Denotes first, joint first, or senior author

REFEREED ORIGINAL RESEARCH ARTICLES

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; PMID: PMC12892304  
 ✦ Featured in Issue Highlights

E. C. Ekpo, L. Beynel, B. Luber, **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; 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.

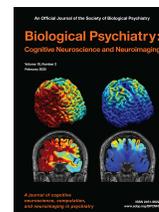
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S. M. McClintock, **Z.-D. Deng**, M. M. Husain, V. J. Thakkar, E. Bernhardt, R. D. Weiner, B. Lubner, and S. H. Lisanby, “Comparing the neurocognitive effects of right-unilateral ultra-brief pulse electroconvulsive therapy and magnetic seizure therapy 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; 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; PMID: PMC11867869; Data available 

 Commentary: vol. 18, no. 3, pp. 897–899, May/Jun. 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; 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. Lubner, 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/fpsyt.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.

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L. Beynel, H. Gura, Z. Rezaee, E. C. Ekpo, **Z.-D. Deng**, J. O. Joseph, P. Taylor, B. Lubner, 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](https://doi.org/10.1371/journal.pone.0302660); PMID: [PMC11073721](https://pubmed.ncbi.nlm.nih.gov/3711073721/); 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](https://doi.org/10.1017/S1092852923006387); PMID: [PMC11524532](https://pubmed.ncbi.nlm.nih.gov/3711524532/)

\* 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](https://doi.org/10.1111/bdi.13370); PMID: [PMC10839568](https://pubmed.ncbi.nlm.nih.gov/3710839568/)

 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](https://doi.org/10.3390/bioengineering11030258); PMID: [PMC10968657](https://pubmed.ncbi.nlm.nih.gov/3710968657/)

 Part of Special Issue: *Electric, magnetic, and electromagnetic fields in biology and medicine: From mechanisms to biomedical applications: 2<sup>nd</sup> 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](https://doi.org/10.1001/jamapsychiatry.2023.4599); PMID: [PMC10701670](https://pubmed.ncbi.nlm.nih.gov/3710701670/)

 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](https://doi.org/10.1038/s41386-023-01780-4); PMID: [PMC10876627](https://pubmed.ncbi.nlm.nih.gov/3710876627/)

 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](https://doi.org/10.1088/1361-6560/ad2638); PMID: [PMC10902857](https://pubmed.ncbi.nlm.nih.gov/3710902857/); 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](https://doi.org/10.1038/s41380-023-02318-2); PMID: [PMC11116108](https://pubmed.ncbi.nlm.nih.gov/3711116108/); 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. Fannelli, 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.

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- \* 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.

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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](https://doi.org/10.1186/s12916-022-02678-6); PMID: [PMC9733153](https://pubmed.ncbi.nlm.nih.gov/35481791/); 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.

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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.

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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.

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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.

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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](https://doi.org/10.1016/j.neuroimage.2021.118863); PMID: [PMC8851689](https://pubmed.ncbi.nlm.nih.gov/35481791/)

 Part of Special Issue: *Neuromodulation and neuroimaging for targeted brain networks interrogation* 

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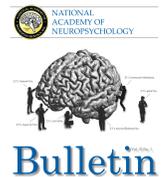
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- \* D. A. Drumm, G. Nuñez Ponasso, A. Linke, S. Ganguly, A. Wang, G. M. Noetscher, B. Maess, T. R. Knösche, J. Haueisen, J. D. Lewine, C. C. Abbott, S. N. Makaroff, and **Z.-D. Deng**, “Improved source localization of auditory evoked fields using reciprocal BEM-FMM,” *bioRxiv*, Jul. 2025.

DOI: 10.1101/2025.05.09.653081; PMID: PMC12132354

C. Lu, **Z.-D. Deng**, and F.-S. Choa, “Augmenting transcranial magnetic stimulation coil with magnetic material: An optimization approach,” *bioRxiv*, Jan. 2022.

DOI: 10.1101/2022.01.21.477303

🏆 Third Place in International Student Competition (awarded to C. Lu), *Brain & Human Body Modeling Conference*, 2021.

- \* **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, 2024 – 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 gamma power and connectivity as biomarkers of ketamine response in treatment-resistant depression,” *Society of Biological Psychiatry Annual Meeting*, Apr./May 2026.

- \* S. Dey and **Z.-D. Deng**, “Closed-loop neuromodulation through the lens of direct and indirect data driven control,” *Society of Biological Psychiatry Annual Meeting*, Apr./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,” *Society of Biological Psychiatry Annual Meeting*, Apr./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. Neacsiu, 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.  
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- ✉ 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.
- L. D. Oliver, D. M. Blumberger, C. Hawco, E. W. Dickie, J. Gallucci, J. Jeyachandra, S. Mansour, **Z.-D. Deng**, S. M. Hare, J. M. Gold, G. Foussias, M. Argyelan, Z. J. Daskalakis, R. W. Buchanan, A. K. Malhotra, and A. N. Voineskos, “Effects of individualized transcranial magnetic stimulation on social cognitive network functional connectivity in schizophrenia spectrum disorders: A target engagement study,” *Neuropsychopharmacology*, vol. 49, suppl. 1, p. 420, Dec. 2024.
- \* C. C. Abbott, T. L. Squillaci, B. A. Kimbrell, J. David, J. Upston, T. Jones, A. Datta, and **Z.-D. Deng**, “Predictive biomarkers to inform ECT parameter selection,” *Neuropsychopharmacology*, vol. 49, suppl. 1, p. 411, Dec. 2024.
- \* **Z.-D. Deng**, J. Kim, B. A. Pritchard, R. H. Schor, G. R. Dold, and S. H. Lisanby, “Multichannel Individualized Stimulation Therapy (MIST): Precision through computational modeling and multitargeted stimulation,” *Neuropsychopharmacology*, vol. 49, suppl. 1, p. 192, Dec. 2024.
- E. Ekpo, L. Beynel, **Z.-D. Deng**, B. Luber, W. T. Regenold, E. Jones, and S. H. Lisanby, “Functional connectivity in depression: Task-based vs resting state fMRI,” *Annual Biomedical Research Conference for Minoritized Scientists*, Nov. 2024.
- E. Jones, T. Torrico, L. Beynel, **Z.-D. Deng**, D. Nielson, E. Wiener, S. Menon, B. Luber, E. Ekpo, W. Regenold, and S. H. Lisanby, “Accelerated intermittent theta burst stimulation for depression,” *American Psychiatric Nurses Association Annual Conference*, Oct. 2024.
- \* E. Bharti, S. Dey, V. Voon, S. M. Goetz, C. A. Zarate, Jr., S. H. Lisanby, and **Z.-D. Deng**, “Personalized brain modeling of psychiatric treatments,” *NIMH IRP Fellows’ Scientific Training Day*, Sep. 2024.
- \* S. Dey and **Z.-D. Deng**, “A robust state estimation strategy for brain stimulation,” *NIMH IRP Fellows’ Scientific Training Day*, Sep. 2024.
- E. Greenstein, Z. Rezaee, **Z.-D. Deng**, L. Oberman, and S. H. Lisanby, “Exploring individual variability in TMS effects: The case for E-field modeling in research,” *NIMH IRP Fellows’ Scientific Training Day*, Sep. 2024.
- \* P. L. Robins, S. H. Lisanby, and **Z.-D. Deng**, “Quantifying aliasing in paper electroencephalography (EEG) during electroconvulsive therapy (ECT),” *J. ECT*, vol. 40, no. 3, p. e20, Sep. 2024.

- 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,” *NYC Neuromodulation Conference*, Aug. 2024.
- L. Beynel, B. Luber, H. Gura, Z. Rezaee, E. Ekpo, **Z.-D. Deng**, O. Joseph, P. Taylor, and S. H. Lisanby, “When the target is a moving target: Practical issues in using task fMRI for rTMS targeting,” *Apert. Neuro*, vol. 4, suppl. 1, pp. 1457–1458, Jun. 2024.
- \* P. L. Robins, J. R. Gilbert, and **Z.-D. Deng**, “Characterizing hippocampal activation with magnetoencephalography using the mnemonic similarity task in healthy participants,” *Apert. Neuro*, vol. 4, suppl. 1, p. 1713, Jun. 2024; also in *Biol. Psychiatry*, vol. 95, no. 10, p. S205, May 2024; and *NIH Postbac Poster Day*, Apr. 2024.
- S. M. Francis, S. N. Menon, L. Beynel, P. L. Robins, **Z.-D. Deng**, A. Thurm, T. White, F. Pereira, L. M. Oberman, and S. H. Lisanby, “Identifying domain-specific nodes using network controllability to determine potential TMS targets for ASD,” *Annual Meeting of the International Society for Autism Research*, May 2024.
- L. D. Oliver, D. M. Blumberger, C. Hawco, E. W. Dickie, J. Gallucci, J. Jeyachandra, **Z.-D. Deng**, J. M. Gold, G. Foussias, M. Argyelan, Z. J. Daskalakis, R. W. Buchanan, A. K. Malhotra, and A. N. Voineskos, “Effects of personalized transcranial magnetic stimulation on social cognitive network functional connectivity in schizophrenia spectrum disorders,” *Biol. Psychiatry*, vol. 95, no. 10, pp. S278–S279, May 2024; also presented at *Annual Congress of the Schizophrenia International Research Society*, Apr. 2024.
- E. Ekpo, L. Beynel, **Z.-D. Deng**, B. Luber, W. T. Regenold, E. Jones, and S. H. Lisanby, “Goal priming: Using a task to assess functional connectivity in depression,” *Biol. Psychiatry*, vol. 95, no. 10, pp. S192–S193, May 2024.
- \* C. C. Abbott, J. Miller, M. Argyelan, S. M. McClintock, and **Z.-D. Deng**, “Individualized amplitude and electroconvulsive therapy,” *Biol. Psychiatry*, vol. 95, no. 10, p. S31, May 2024.
- M. Argyelan, **Z.-D. Deng**, O. T. Ousdal, L. Oltedal, G. Petrides, A. Malhotra, and C. C. Abbott, “Electroconvulsive therapy-induced volumetric brain changes converge on a common causal circuit in depression,” *Biol. Psychiatry*, vol. 95, no. 10, pp. S29–S30, May 2024.
- ✍ S. N. Menon, S. M. Francis, L. Beynel, P. L. Robins, **Z.-D. Deng**, A. Thurm, T. White, F. Pereira, P. Taylor, L. M. Oberman, and S. H. Lisanby, “Localizing brain networks in autism: A protocol to identify potential rTMS targets,” *NIH Julius Axelrod Symposium*, Apr. 2024; also presented at *NIMH IRP Fellows’ Scientific Training Day*, Sep. 2023.

INTELLECTUAL  
PROPERTY

- 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, Nov. 12, 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 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.
- 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. ☑

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 electromagnetic modeling.

*Novel electric-field modeling approach to quantify changes in resting state functional connectivity following theta burst stimulation*

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.

*Development of a novel, scalable, neurobiologically-guided transcranial magnetic stimulation protocol for the treatment of cannabis use disorder*

Centre for Addiction and Mental Health, Toronto, ON, Canada 2023.02–  
Role: Consultant; PI: V. M. Tang  
This proof-of-concept clinical trial will evaluate the feasibility and tolerability of a 4-week course of rTMS to the prefrontal cortex and insula as a treatment for cannabis use disorder.

*Deciphering mechanisms of ECT outcomes and adverse effects (DECODE)*

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

- Individualized ECT electrode placement to improve clinical outcomes in older adults*  
NIH/NIMH R61/R33 2026.02  
Role: mPI; collaborating PIs: C. C. Abbott, A. Datta
- Accelerated intermittent theta burst for methamphetamine use disorder*  
NIH/NIMH R61/R33 2026.02  
Role: Intramural NIH collaborator; mPIs: M. Jha, H. Ekhtiari, K. Brady, A. Datta
- Analysis of two 1-mm<sup>3</sup> cortical brain samples with boundary element fast multipole method to better understand brain stimulation*  
NIH R01 2025.12  
Role: Intramural NIH collaborator; PI: S. N. Makaroff
- PRrecision Optimally Targeted ECT (PROTECT) First in Human*  
NIH/NIMH UG3/UH3 2025.09  
Role: mPI; collaborating PIs: C. C. Abbott, A. Datta
- High-density theta burst stimulation at 100 Hz: Development and first trial in cocaine use disorder*  
NIH UG3/UH3 2025.09  
Role: Intramural NIH collaborator; PI: H. Lu
- PRrecision Optimally Targeted ECT (PROTECT)*  
NIH/NIMH R01 2025.06  
Role: mPI; collaborating PIs: C. C. Abbott, A. Datta
- Transdiagnostic trial to reduce default mode network connectivity in bipolar depression and major depressive disorder with accelerated iTBS*  
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 K23 MH087739 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 R01 MH091083 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/NICRR TL1 RR024158 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 R21 EB006855 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 R01 HL079503 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"/>	<b>30</b> Invited seminars
	<input type="text"/>	<b>18</b> Invited symposia, webinars, & workshops
	<input type="text"/>	<b>7</b> Grand rounds
	<input type="text"/>	<b>25</b> Invited conference panels
	<input type="text"/>	<b>9</b> Contributed conference presentations

⌘ **Denotes Continuing Medical Education accredited presentation**

- INVITED SEMINARS
- UCSD, Department of Psychiatry 2026.04  
Interventional Psychiatry Research Program  
*Computational neuroengineering for precision neuromodulation: Dose, device, and treatment optimization*
- ⌘ The Ohio State University College of Medicine 2025  
Center for Neuroimaging, Neurophenotyping, Neurocomputation, and Neuromodulation  
*Computational design of next-generation neurostimulation therapies*
- UC Irvine, Department of Biomedical Engineering 2025  
*Computational neuroengineering for precision psychiatry: Brain stimulation modeling, dosing, and device innovation*
- Arizona State University, School for Biological and Health Systems Engineering 2025  
*Model-driven neurostimulation: Computational approaches to device and dose optimization*
- NIMH Intramural Research Program Investigators' Seminar 2025  
*Reading tells: Using facial expression analysis to track emotional states in depression*

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, &amp; 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)	2026.06
	Clinical TMS Society Annual Meeting <i>From physics to practice: Understanding E-field modeling in clinical TMS</i>	2026.06
‡	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>	2018

	Preconference workshop: Computational modeling in neuromodulation	
	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 &amp; OCD</i>	2026.06
	Electroconvulsive Therapy Conference & GEMRIC Workshop <i>ECT time machine: What yesterday's devices teach about tomorrow's therapy</i> Panel: <i>Therapeutic components of ECT: Electric field</i>	2025
	⌘ American Neuropsychiatric Association Annual Meeting <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>	2025
	International Brain Stimulation Conference <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	2025
	International Society for Magnetic Resonance in Medicine Annual Meeting <i>TMS devices and modeling</i> Workshop: <i>From basics to applications: MRI of neuromodulation using TMS and FUS</i>	2024
	International Conference of the IEEE Engineering in Medicine and Biology Society <i>Modeling of TMS and ECT in the treatment of depression</i> Panel: <i>Computational analysis of non-invasive neuromodulation constructs: Brain &amp; spine</i>	2023
	⌘ ADA Anxiety and Depression Conference <i>Modeling and dose optimization for TMS and ECT</i>	2023

Panel: *Parsing through syndromic heterogeneity in youths with mental illness to identify neurocircuit mechanisms and develop novel treatments*

- ⌘ International Society for Magnetic Resonance in Medicine 2022  
*Modeling of TMS*   
Workshop: *MRI of neuromodulation: Target engagement, neural mechanism, & biomarker development*
- Bergen Workshop of the Global ECT–MRI Collaboration 2022  
*ECT device development*   
Panel: *Dosing strategies and future of neurostimulation techniques in ECT*
- Brain and Human Body Modeling Conference 2022  
*ECT, electric field, neuroplasticity, and clinical outcomes*  
Panel: *Modeling of transcranial electrical stimulation and deep brain stimulation*
- European Conference of Brain Stimulation in Psychiatry 2022  
*Symptom dimensions and response trajectories in ECT and MST*  
Panel: *Beyond clinical syndromes: Understanding mechanisms of neuromodulation from a dimensional perspective*
- ⌘ Society of Biological Psychiatry Annual Meeting 2022  
*Depressive symptom dimensions in seizure therapy*  
Panel: *Dimensional approaches to device neuromodulation*
- ⌘ American Academy of Child and Adolescent Psychiatry Annual Meeting 2021  
*Introduction to computational psychiatry*  
Panel: *Recent work with contemporary computational methods and artificial intelligence to advance the practice of child and adolescent psychiatry*
- European College of Neuropsychopharmacology Congress 2021  
*Precision neurostimulation: Electroconvulsive therapy*  
Panel: *Neurobiology of rapid mood changes*
- European Conference of Brain Stimulation in Psychiatry 2020  
*Electric field modeling to inform ECT dosing and device development*  
Panel: *What can we learn from ECT: Insights from the GEMRIC consortium*
- NYC Neuromodulation Online 2020  
Discussant, *Noninvasive vagus nerve stimulation applied to stress management, opioid withdrawal, and neurocognitive disorders*
- American Society of Clinical Psychopharmacology Annual Meeting 2020  
*Advancing seizure therapy: Rational design for precision outcomes*  
Panel: *New developments in neurostimulation*
-  Accepted for presentation; conference was canceled due to COVID-19 pandemic
- ⌘ American College of Neuropsychopharmacology Annual Meeting 2019  
*Rational design of precision seizure therapy*  
Panel: *Precision neurostimulation for treatment of psychiatric disorders*
- International College of Neuropsychopharmacology International Meeting 2019  
*Individualized seizure therapy: Reinventing ECT*  
Workshop: *Neurobiological and clinical characterization, and treatment development for treatment resistant depression*
- International Brain Stimulation Conference 2019  
*Individualized electroconvulsive therapy for treatment of depression*  
Panel: *Individualized brain stimulation: Addressing heterogeneity across modalities*
- Joint NYC Neuromodulation Conference & NANS Summer Series 2018  
*High-density ECT: Optimizing stimulation arrays and high-density EEG for brain targeting*  
Panel: *New targets and technology of electroconvulsive therapy*

	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	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	<b>Guest Lecturer, NIH</b> National Institute of Mental Health <i>Basic Training Course on Transcranial Magnetic Stimulation</i>  <i>fMRI Summer Course</i> 	2020 2017
	National Institute of Neurological Disorders and Stroke <i>Clinical Neuroscience Program Lecture Series</i>	2017, 2019
	<b>Research Mentor, University of Maryland, College Park</b> Fischell Department of Bioengineering	2018–2019
	<b>Faculty, Duke University</b> 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
	<b>Teaching Assistant, Columbia University</b> Department of Electrical Engineering <i>Analog Systems in VLSI</i> (graduate level; 33 students + 1 auditor) <i>The Digital Information Age</i> (25 students + 2 auditors)	Spring 2010 Fall 2009

**Recitation Instructor**, Columbia University Mailman School of Public Health  
 Department of Biostatistics  
*Biostatistics* (graduate level; 26 students + 1 auditor) Fall 2009

**Teaching Assistant**, MIT  
 Concourse Program  
*Multivariable Calculus* Fall 2003–2006  
*Differential Equations* Spring 2004–2007

MENTORING  
 SUMMARY

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

FACULTY  
 ADVISORY

D. C. Farrar, M.D., Ph.D., University of New Mexico School of Medicine 2025–  
 Project: “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–  
 Project: “Targeting negative self-referential processing in depression with transcranial mag-  
 netic stimulation”

S. M. Hare, Ph.D., University of Maryland School of Medicine  
 NIH/NIMH K01 MH133116 2024–2029  
 Project: “Cognitive and neural correlates of TMS motor intracortical inhibition in schizo-  
 phrenia”

S. H. Siddiqi, M.D., Brigham & Women’s Hospital  
 NIH/NIMH K23 MH121657 2020–2025  
 Project: “Personalized circuit-based neuromodulation targets for depression”  
 ☉ Klerman Prize for Exceptional Clinical Research, *Brain & Behavior Research Foundation*, 2022.

N. L. Balderston, Ph.D., NIMH / University of Pennsylvania Perelman School of Medicine  
 NIH/NIMH K01 MH121777 2019–2023  
 Project: “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, *Brain & Behavior Research Foundation*, 2021.

RESEARCH  
 FELLOWS &  
 POSTDOCS

S. Dey, Ph.D., NIMH Visiting Postdoctoral Fellow 2024–  
 M. Dannhauer, Ph.D., NIMH Research Fellow 2022–2024  
 Career progression: Assistant Professor, Computer Science, East Carolina University

SPONSORED  
 THESES

G. Asturias, Psychology & Neuroscience, Duke University 2015–2017  
 B.S. honors thesis: “Effect of repetitive transcranial magnetic stimulation on the structural  
 and functional connectome in patients with major depressive disorder.”  
 Available: *DukeSpace*, HDL: 10161/14299  
 ☉ Graduated with Distinction  
 Career progression: Medical student, Stanford University School of Medicine

THESIS  
 EXAMINATION  
 COMMITTEES

D. Tang, Electrical & Computer Engineering, Worcester Polytechnic Institute  
 - Ph.D. thesis committee 2026–  
 - M.S. thesis: “Computational and experimental approaches to brain stimulation: TMS sim-  
 ulation, coil measurement, and neural structure analysis.” Sponsor: S. N. Makaroff. 2025  
 Available: *Digital WPI*, URL: <https://digital.wpi.edu/show/6h440x853>

	S. J. Bolland, Biomedical Engineering, University of Western Australia	2025
	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	
	W. A. Wartman, Electrical & Computer Engineering, Worcester Polytechnic Institute	2024
	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: <a href="https://digital.wpi.edu/show/sq87c029w">https://digital.wpi.edu/show/sq87c029w</a>	
	D. Q. Troung, Biomedical Engineering, CUNY City College	2019
	Ph.D. dissertation: “Translational modeling of non-invasive electrical stimulation.” Sponsor: M. Bikson. Available: <i>CUNY Academic Works</i> , URL: <a href="https://academicworks.cuny.edu/cc_etds_theses/774">https://academicworks.cuny.edu/cc_etds_theses/774</a>	
GRADUATE STUDENTS	E. Bharti, Ph.D. candidate, NIH–Cambridge Scholars Program Co-advised with Prof. Valerie Voon (University of Cambridge)	2024–
	M. Kshirsagar, M.S., 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 &amp; Human Body Modeling Conference</i> , 2022. Career progression: Lead interventional technician, Columbia Mental Health	2021–2024
	M. R. Hynd, B.S., NIMH IRTA Fellow Career progression: Ph.D. student, University of North Carolina at Chapel Hill	2020–2022
	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 Mentored 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 Career progression: Ph.D. student, North Carolina State University	Summer 2013
PROFESSIONAL SOCIETIES MEMBERSHIP	<b>Institute of Electrical and Electronics Engineers (IEEE)</b> Senior Member (2023 –), Member (2013 – 2023), Student Member (2004 – 2013) Engineering in Medicine and Biology Society Brain Technical Community	2004 – 2025 –
	<b>American College of Neuropsychopharmacology</b> , Associate Member	2023 –
	<b>Biomedical Engineering Society</b> , Member	2021 –
	<b>American Society of Clinical Psychopharmacology</b> , Member	2019 –
	<i>Past memberships:</i> Anxiety and Depression Association of America, Member International Society for CNS Clinical Trials and Methodology, Member Organization for Human Brain Mapping, Member Society for Industrial and Applied Mathematics, Student Member Society for Neuroscience, Student Member American Physical Society, Student Member	2017 – 2018 2017 – 2019 2014 – 2019 2008 – 2012 2005 – 2012 2004 – 2009
PROFESSIONAL SERVICE & ADVISORY ROLES	American College of Neuropsychopharmacology Program Committee Mentor, Travel Award Program Mentee: Y. Lee, Ph.D., National Institute of Mental Health	2026 – 2026
	Advisory Board, Center for Multiscale Bioelectromagnetic Studies of the Brain Department of Electrical & Computer Engineering, Worcester Polytechnic Institute	2025 –
	Board Member, The Global ECT–MRI Research Collaboration (GEMRIC) Data Processing and MRI Working Group	2025 –

	Biomedical Engineering Society	
	Mid-Career Award Subcommittee	2025
	Reviewer, Chapter Development Report	2025
	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	
	Co-founder & Scientific Advisor, Singula Institute	2017–2025
INSTITUTIONAL SERVICE	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
GRANT REVIEW	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>	2025–
	Deputy Editor, <i>Transcranial Magnetic Stimulation</i>	2024–
	Associate Editor, <i>Frontiers in Psychiatry</i>	2022–
	Sections: Neurostimulation, Neuroimaging	
	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>	2022–
	Sections: Addictive Behaviors, Consciousness Research	
	Review Editor, <i>Frontiers in Psychiatry</i>	2016–2022
	Sections: Neurostimulation, Neuroimaging	
	Guest Associate Editor, <i>Frontiers in Pharmacology: Neuropharmacology</i>	2020
	Co-Editor on Research Topic: <i>Neurobiology of rapid mood changes</i> ☑	
	Guest Editor, <i>Physics in Medicine &amp; Biology</i>	2024
	Special Issue: <i>Electromagnetic modeling for brain stimulation</i> ☑	
	<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>	

*Bioelectromagnetics*  
*Biological Psychiatry*  
*Biological Psychiatry: Global Open Science*  
*BioMedical Engineering OnLine*  
*Biomedical Signal Processing and Control*  
*Biomedicines*  
*BMJ Mental Health*  
*Brain Research Bulletin*  
*Brain Sciences*  
*Brain Stimulation*  
*Cerebral Cortex*  
*Chaos, Solitons & Fractals*  
*Clinical EEG and Neuroscience*  
*Clinical Neurophysiology*  
*CNS Spectrums*  
*Computational and Mathematical Methods in Medicine*  
*Computer Methods and Programs in Biomedicine*  
*Computer Methods in Biomechanics and Biomedical Engineering*  
*Cortex*  
*Depression and Anxiety*  
*Epilepsy & Behavior Reports*  
*European Psychiatry*  
*Frontiers in Cell and Developmental Biology*  
*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*  
*Nature Mental Health*  
*NeuroImage*  
*NeuroImage Clinical*  
*Neuromodulation*  
*Neuroscience Letters*  
*PLOS Computational Biology*  
*PLOS ONE*  
*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 Program review subcommittee	2023, 2026	
	Brain and Human Body Modeling Conference Organizing committee, and judge in student competition Chair of panel: <i>New modeling methods: Spinal cord stimulation and novel stimulation</i> Chair of panel: <i>Development and assessment of modeling methods</i>	2023	
	International Brain Stimulation Conference Chair of symposium: <i>Insights and challenges in preclinical models of TMS: Multimodal investigations across animal species</i> Chair of symposium: <i>Advanced computational modeling and optimization methods for non-invasive brain stimulation</i>	2023	
	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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