



Conference Zoom Link: <https://us06web.zoom.us/j/86961326195>

All in-person presentations will be in Room 2204 in Building 149 on both days

3rd Annual Brain & Human Body Modeling (BHBM) Conference (Online format with in-person participation)

August 17-18, 2023

A.A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Charlestown MA

<https://tmslab.martinos.org/conferences/brain-and-human-body-modeling-conference-2023-online-format-with-limited-in-person-participation/>

Support of the A.A. Martinos Center for Biomedical Imaging, Worcester Polytechnic Institute, Max Planck Inst. for Human Cognitive and Brain Sciences, Novocure, Inc., and the National Institute of Mental Health (NIMH), is greatly acknowledged

Conference Room 2204 of Building 149 (149 13th Street, Charlestown MA; parking garage is across the street; street parking is also available). To obtain a temporary pass, please inform the receptionist that you will be attending BHBM 23. An email to snmakaroff@wpi.edu or gregn@wpi.edu will be answered immediately.

Recordings of all talks will be posted on the Conference website at Massachusetts General Hospital with distribution through the network of Harvard Medical School

Program as of August 16, 2023

Presentation schedule (presentation times have been corrected to accommodate different time zones):

All review presentations: from 20 to 30 min (including ~3-5 min for questions)

All research presentations: from 10 to 20 min (including ~2-5 min for questions)

Note all times given below are Eastern Standard Time (EST), USA

All presentations from students (including post doctorate and part-time students) are eligible for student competition 2023 (*the student must be the first, presenting author*). A monetary award (\$1,000, 2x\$500, and 2x\$300) and an award plaque will be mailed to the winners within a month after the end of the conference.

<https://tmslab.martinos.org/conferences/brain-and-human-body-modeling-conference-2022/student-competition/>

Names of the authors eligible for the student competition (28 authors) are underlined

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Conference-based publications are accepted for a Special Edition of Physics in Medicine and Biology: <https://iopscience.iop.org/journal/0031-9155/page/electromagnetic-modeling-for-brain-stimulation>

2023 BHBM Conference Organizers:

Kyoko Fujimoto, kyoko.fujimoto@ge.com, Gregory M. Noetscher, gregn@wpi.edu, Konstantin Weise, kweise@cbs.mpg.de, Thomas R. Knösche, knoesche@cbs.mpg.de, Sofia R. Fernandes, srofernandes@fc.ul.pt, Zhi-De Deng, zhi-de.deng@nih.gov, Hanbing Lu, luha@intra.nida.nih.gov, Aapo R. Nummenmaa, nummenma@nmr.mgh.harvard.edu, Sergey N. Makaroff, snmakaroff@wpi.edu

Opening Session***Thursday Aug. 17, 2023, Online Presentations*****Chair: Kyoko Fujimoto (GE HealthCare), kyoko.fujimoto@ge.com**

#	Presenters/email	Title	Organization	EST (USA)
1	Bruce Rosen brrosen@mgh.harvard.edu	Opening remarks	Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	8:05 AM – 8:15 AM
2	Jean King jaking@wpi.edu	Computational Neuroscience: NeuroTech and Digital Health at WPI	Dean in the School of Arts and Sciences, Worcester Polytechnic Institute, Worcester MA USA	8:15 AM – 8:30 AM
3	Yvonne Bennett yvonne.bennett@nih.gov	BRAIN Initiative Sensors Program and other recent NIMH initiatives	NIMH Office of Technology Development and Coordination, National Institutes of Health	8:30 AM – 8:45 AM
	Questions to presenters, coffee break			8:45 AM – 9:00 AM

Session I: New Modeling Methods and Pipelines***Thursday Aug. 17, 2023, In person and online presentations*****Chair: Gregory Noetscher (US ARMY DEVCOM-SC and WPI), gregory.m.noetscher.civ@army.mil**

#	Presenters/email	Title	Organization	EST (USA)
4	Fariba Karimi ^{1,2} , Taylor H. Newton ^{1*} , Bryn Lloyd ¹ , Javier Garcia Ordonez ¹ , Melanie Steiner ¹ , AmirAli Farokhniaee ¹ , Jan Paul Triebkorn ³ , Huifang Wang ³ , Viktor Jirsa ³ , Niels Kuster ^{1,2} , and Esra Neufeld ¹ newton@itis.swis	A pipeline for personalized modeling of electrical neuromodulation: From image segmentation to brain activity	¹ Foundation for Research on Information Technologies in Society (IT'IS), Zurich, Switzerland ² Dept. of Information Technology and Electrical Engineering, ETH Zurich, Zurich, Switzerland ³ Institut de Neurosciences des Systèmes, Marseille, France	9:00 AM – 9:30 AM
5	Konstantin Weise ^{1,2} , Kristoffer H. Madsen ^{3,4} , Thomas R. Knösche ² , Anders Korshøj ¹ , Axel Thielscher ^{4,5} kweise@cbs.mpg.de	A flexible optimization framework for transcranial electric stimulation, temporal interference stimulation and tumor treating fields	¹ Dept. of Clinical Medicine, Aarhus Univ., Aarhus, Denmark ² M&D Group <i>Brain Networks</i> , Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany ³ Technical Univ. of Denmark, Section for Cognitive Systems, Dept. of Applied Mathematics and Computer Science, Kongens Lyngby, Denmark ⁴ Danish Research Centre for Magnetic Resonance, Centre for Functional and Diagnostic Imaging and Research, Copenhagen Univ. Hospital Amager and Hvidovre, Denmark ⁵ Technical Univ. of Denmark, Section for Magnetic Resonance, Dept. of Health Technology, Kongens Lyngby, Denmark	9:30 AM – 10:00 AM

	Questions to presenters, coffee break			10:00 AM – 10:15 AM
6	<p><u>Tim Erdbrügger</u>¹, Andreas Westhoff¹, Malte Höltershinken¹, Jan-Ole Radecke^{2,3}, Yvonne Buschermöhle¹, Alena Buyx⁴, Fabrice Wallois⁵, Sampsa Pursiainen⁶, Joachim Gross¹, Rebekka Lencer^{2,3}, Christian Engwer⁷ and Carsten Wolters¹</p> <p>tim.erdruegger@uni-muenster.de</p>	CutFEM forward modeling for MEG source analysis	<p>¹Inst. for Biomagnetism and Biosignalanalysis, Univ. of Münster, Münster, Germany</p> <p>²Dept. of Psychiatry and Psychotherapy, Univ. of Lübeck, Lübeck, Germany</p> <p>³Center for Brain, Behavior and Metabolism (CBBM), Univ. of Lübeck, Lübeck, Germany</p> <p>⁴Inst. of History and Ethics in Medicine, Technical Univ. of Munich, Germany</p> <p>⁵Institut National de la Sante' et de la Recherche Me'dicale, Univ. of Picardie Jules Verne, France</p> <p>⁶Computing Sciences Unit, Faculty of Information Technology and Communication Sciences, Tampere Univ., Finland</p> <p>⁷Inst. for Analysis and Numerics, Univ. of Münster, Münster, Germany</p>	10:15 AM – 10:35 AM
7	<p>William Wartman^{1,2*}, Manas Rachh³, Vishwanath Iyer², Leslie Greengard⁴, Gregory Noetscher¹, Mohammad Daneshzand⁵, Matti Hämäläinen⁶, Jyrki P. Ahveninen⁵, Konstantin Weise⁷, Tommi Raji⁵, Aapo Nummenmaa⁵, Sergey Makaroff^{1*}</p> <p>snmakaroff@wpi.edu</p>	Boundary element fast multipole method for mesoscale and multiscale brain modeling	<p>¹Electrical and Computer Eng., Worcester Polytechnic Inst., Worcester MA USA</p> <p>²The MathWorks, Inc., Natick, USA</p> <p>³Center for Computational Mathematics, Flatiron Inst., New York, USA</p> <p>⁴Dept. of Mathematics, Courant Inst. of Mathematical Sciences, New York Univ., USA</p> <p>⁵Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston USA</p> <p>⁶Dept. of Neuroscience and Biomedical Engineering, School of Science, Aalto Univ., Espoo, Finland</p> <p>⁷M&D Group <i>Brain Networks</i>, Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany</p>	10:35 AM – 10:55 AM
	Questions to presenters, lunch (US)/dinner (Europe)			10:55 AM – 11:50 AM

Session II: New Modeling Methods and Targets Including Cellular Modeling - TMS*Thursday Aug. 17, 2023, In person and online presentations*

Chairs: Thomas Knösche (Max Planck Inst.), knoesche@cbs.mpg.de, Aapo Nummenmaa (Massachusetts General Hospital), nummenma@nmr.mgh.harvard.edu

#	Presenters/email	Title	Organization	EST (USA)
8	Thomas Knösche, Ole Numssen, Gesa Hartwigsen, Konstantin Weise knoesche@cbs.mpg.de	Smart TMS Mapping – Novel Approaches to Mapping and Modeling	Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany	11:50 AM – 12:10 PM
9	Nahian Ibn Hasan , Dezhi Wang, Luis J. Gomez ljgomez@purdue.edu	Application of Fast E-Field Solvers in Developing Individualized Optimal Transcranial Magnetic Stimulation	Elmore Family School of Electrical and Computer Engineering Purdue Univ., West Lafayette USA	12:10 PM – 12:30 PM
10	Mohammad Daneshzand mdaneshzand@mgh.harvard.edu	Assessment of modular multichannel TMS array combined with EMG and EEG	Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	12:30 PM – 12:50 PM
11	Luis Gomez ¹ , Hao Zhang ² , Johann Guilleminot ³ ljgomez@purdue.edu	Uncertainty quantification of TMS simulations considering MRI segmentation errors	¹ Dept. of Electrical and Computer Engineering, Purdue Univ., West Lafayette USA ² Dept. of Civil and Environmental Eng., Duke Univ., Durham USA ³ Dept. of Civil and Environmental Engineering, Duke Univ., Durham USA	12:50 PM – 13:10 PM
12	Aaron Miller , Thomas R. Knösche, Konstantin Weise miller@cbs.mpg.de	A neural mass model of TMS induced I- waves in the primary motor cortex	Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany	13:10 PM – 13:30 PM
	Questions to presenters, coffee break			13:30 PM – 13:40 PM

Session III: New Modeling Methods and Targets – Spinal cord stimulation and novel stimulation targets*Thursday Aug. 17, 2023, In person and online presentations*

Chair: Sofia Rita Fernandes (U Lisbon), srfernandes@fc.ul.pt, Zhi-De Deng (NIH/NIMH), zhi-de.deng@nih.gov

#	Presenters/email	Title	Organization	EST (USA)
13	Laureen Wegert ¹ , Alexander Hunold ^{1,2} , Marek Ziolkowski ¹ , Tim Kalla ¹ , Irene Lange ¹ , Jens Haueisen ¹ laureen.wegert@tu-ilmenau.de	Comparison of phrenic nerve stimulation set- ups using an anatomically detailed volume conductor model of the neck	¹ Inst. of Biomedical Engineering and Informatics, Faculty of Computer Sciences and Automation, Technische Universität Ilmenau, Ilmenau, Germany	13:40 PM – 14:00 PM

			² neuroConn GmbH, Ilmenau, Germany	
14	Sofia Rita Fernandes srcfernandes@fc.ul.pt	Modelling challenges in non-invasive spinal stimulation: perspectives on current state-of-the-art	Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências, Universidade de Lisboa, Portugal	14:00 PM – 14:20 PM
15	Jae-Ik Lee, Shelley Fried, jlee275@mg.harvard.edu	Magnetic stimulation allows focal activation of the mouse cochlea	Neurosurgery Massachusetts General Hospital, Boston MA USA	14:20 PM – 14:40 PM
	Questions to presenters, coffee break			14:40 PM – 14:50 PM

Session IV: Practical aspects of TMS modeling

Thursday Aug. 17, 2023, In person and online presentations

Chairs: Ravi Hadimani (Virginia Commonwealth University), rhadimani@vcu.edu, Lucia Navarro de Lara (Martinos Center), lnavarrodelara@mg.harvard.edu

#	Presenters/email	Title	Organization	EST (USA)
16	Zh-De Deng zhi-de.deng@nih.gov	The effect of low-field magnetic stimulation	Computational Neurostimulation Research Program, Noninvasive Neuromodulation Unit, Experimental Therapeutics & Pathophysiology Branch, National Institute of Mental Health, NIH, Bethesda MD USA	14:50 PM – 15:10 PM
17	Mohannad Tashli ¹ , Aryan Mhaskar ^{1,2} , George Weistroffer ³ , Deepak Kumbhare ⁴ , Mark S. Baron ^{5,6,7} , Ravi L. Hadimani ^{1,3,8} tashlims@vcu.edu	Innovative transcranial magnetic stimulation coil designs for small animals utilizing multi-magnetic materials for enhanced E-field focality	¹ Dept. of Mechanical and Nuclear Engineering, Virginia Commonwealth Univ., Richmond, VA USA. ² Ctr. for Biomedical Sciences, M. E. Godwin High School, Richmond, VA USA ³ Dept. of Biomedical Engineering, Virginia Commonwealth Univ., Richmond VA, USA. ⁴ Dept. of Neurosurgery, Louisiana State Univ. Health Center, Shreveport, Louisiana, USA ⁵ McGuire Research Inst., Hunter Holmes McGuire VA Medical Center, Richmond, VA, USA ⁶ Southeast Parkinson's Disease Research, Education and Clinical Center, Hunter Holmes McGuire Veterans Affairs Medical Center, Richmond, VA, USA. ⁷ Dept. of Neurology, Virginia Commonwealth Univ., Richmond, VA, USA.	15:10 PM – 15:25 PM

			⁸ Martinos Biomedical Imaging Center, Harvard Medical School, Harvard Univ., Boston, MA, USA	
18	<u>Wesley Lohr</u> lohrw@vcu.edu	Anatomically and conductively accurate rat head phantoms for transcranial magnetic stimulation	Virginia Commonwealth Univ., Richmond, VA, USA.	15:25 PM – 15:40 PM
19	<u>Shih-Cheng Chien</u> ^{1,2} , Christian Röse ² , Peng Wang ^{2,3} , Helmut Schmidt ¹ , Thomas R. Knösche ² , Konstantin Weise ² chien@cs.cas.cz	A biological model of spinal and peripheral motor pathways for TMS-induced MEPs	¹ Inst. of Computer Science, Czech Academy of Sciences, Prague, Czech Republic ² Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany ³ Inst. of Psychology, Univ. of Greifswald, Greifswald, Germany	15:40 PM – 15:55 PM
20	<u>Maria Nazarova</u> mnazarova@partners.org	Stimulation of Cortical Spinal Tract during Cerebellar TMS	Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital	15:55 PM – 16:10 PM
21	<u>Mehmet A. Ozdemir</u> ^{2,3} , Onan Guren ³ , Mouhsin M. Shafi ^{1,2} , Recep A. Ozdemir ^{1,2} ozdemir@bidmc.harvard.edu	Prediction of intermittent theta burst stimulation response using machine learning	¹ Berenson-Allen Center for Noninvasive Brain Stimulation, Dept. of Neurology, Beth Israel Deaconess Medical Center, Boston, MA, United States of America ² Dept. of Neurology, Harvard Medical School, Boston, MA, USA ³ Dept. of Biomedical Engineering, Izmir Katip Celebi Univ., Izmir, Turkey	16:10 PM – 16:25 PM
22	<u>Yuchao Wang</u> , Isha Vora, Baothy Huyhn, Matthew Picard-Fraser and Teresa Kimberley YWang1@MGHIHP.EDU	What you're not considering that may be impacting your TMS data	School of Health and Rehabilitation Sciences MGH Institute of Health Professions, Boston MA USA	16:25 PM – 16:40 PM
23	Aapo Nummenmaa anummenmaa@mg.harvard.edu	What exactly are we modeling? – A virtual tour of TMS Core Lab, Athinoula A. Martinos Ctr. for Biomedical Imaging	Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	16:40 PM – 17:10 PM
	Questions to presenters, coffee break			17:10 PM – 17:20 PM

Conference dinner: Meet at 17:30 PM at the ferry terminal

Friday Aug. 18th (Sessions start at 7 AM EST)**Session V: MEG Practice and MEG Modeling***Friday Aug. 18, 2023, In person and online presentations*

Chairs: Padma Sundaram (MGH), padma@nmr.mgh.harvard.edu, Hermann Kutschka (MPI), hermann.kutschka@cbs.mpg.de

#	Presenters/email	Title	Organization	EST (USA)
24	Burkhard Maess, Hermann Kutschka maess@cbs.mpg.de hermann.kutschka@cbs.mpg.de	Virtual tour of MEG OPM facility at Max Planck	MEG Lab, MEG Group Outstation, Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany	7:00 AM – 7:20 AM
25	Padma Sundaram, Mainak Jas padma@nmr.mgh.harvard.edu	Setup of a room temperature MEG system at the Martinos Center	Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	7:20 AM – 7:35 AM
26	Mainak Jas mjas@mgh.harvard.edu	Forward calculations for OPM MEG	Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	7:35 AM – 7:45 AM
27	Teppei Matsubara, Padma Sundaram tmatsubara@mgh.harvard.edu	Forward calculations for cerebellar MEG in epilepsy	Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	7:45 AM – 7:55 AM
	Questions to presenters, coffee break. Please consider asking more detailed questions offline.			7:55 AM- 8:00 AM

Session: VI: Cellular Level Based Modeling*Friday Aug. 18, 2023, In person and online presentations*

Chairs: Hanbing Lu (NIDA), luha@intra.nida.nih.gov, Luis Gomez (Purdue University) ljgomez@purdue.edu

#	Presenters/email	Title	Organization	EST (USA)
28	Konstantin Weise ¹ , Torge Worbs ^{1,2} , Benjamin Kalloch ¹ , Victor H. Souza ¹ , Aurélien Tristan Jaquier ² , Werner Van Geit ² , Axel Thielscher ^{1,2} , Thomas R. Knösche ¹	Directional sensitivity of cortical neurons towards TMS induced electric fields	¹ Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany ² Danish Research Centre for Magnetic Resonance, Copenhagen Univ. Hospital Hvidovre, Denmark	8:00 AM – 8:17 AM
29	Hanbing Lu, Hieu Nguyen, Charlotte Li, Samantha Hoffman, Yihong Yang luha@intra.nida.nih.gov	What neuronal elements are stimulated by TMS? Simulations and experiments on awake rats	National Inst. on Drug Abuse (NIDA), NIH USA	8:17 AM – 8:34 AM
30	P. Sundaram padma@nmr.mgh.harvard.edu	Cellular mechanisms of TMS in cerebellum	Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	8:34 AM – 8:51 AM
31	David M. Czerwonky, Luis J. Gomez dczerwon@purdue.edu ljgomez@purdue.edu	Computational E-field dosimetry with in-tissue neuron analysis using a boundary element approach	Purdue Univ., West Lafayette IN, USA	8:51 AM – 9:08 AM

32	<u>Alton Miles</u> ¹ , Gregory M. Noetscher ¹ , Zhen Qi ¹ , Konstantin Weise ² , Aapo Nummenmaa ³ , Sergey Makaroff ^{1,3}	Cortical neuron tissue analysis with boundary element fast multipole method – the extracellular problem	¹ ECE Dept., Worcester Polytechnic Inst., Worcester USA ² Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig Germany ³ Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA	9:08 AM – 9:25 AM
Questions to presenters, coffee break. Please consider asking more detailed questions offline.				9:25 AM – 9:30 AM

Session VII: (Micro) Vascular Stimulation and Modeling*Friday Aug. 18, 2023, Online presentations***Chair: Jonathan Polimeni (MGH), jrpolimeni@mgh.harvard.edu**

#	Presenters/email	Title	Organization	EST (USA)
33	Marom Bikson bikson@ccny.cuny.edu	Neuro-vascular modulation: what a new mechanism suggests about how brain stimulation works and how to interpret hemodynamic imaging?	The City College of New York of CUNY, New York USA	9:30 AM – 10 AM
34	<u>Grant Hartung</u> ¹ , Jonathan Polimeni ¹ , Aapo Nummenmaa ^{1,2} , Sergey Makaroff ² ghartung@mgh.harvard.edu presented by S. Makaroff ²	Fast computational modeling of susceptibility-induced variations of magnetic fields in brain microvascular networks	¹ Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA ² Worcester Polytechnic Institute, Worcester MA USA	10:00 AM – 10:20 AM
Questions to presenters, coffee break				10:20 AM – 10:30 AM

Session VIII: tDCS Modeling*Friday Aug. 18, 2023, In person and online presentations***Chair: Benjamin C. Nephew (WPI), bnephew@wpi.edu**

#	Presenters/email	Title	Organization	EST (USA)
35	<u>Vasco Marques da Silva</u> ^{1,2} , Alexandre Andrade ¹ , Sofia Rita Fernandes ^{1,3} , Hugo Alexandre Ferreira ¹ fc49559@alunos.fc.ul.pt	Targeted tDCS in sensorimotor networks: A functional connectivity study	¹ Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal ² Iberchem, S.A., P.I. Oeste, Alcantarilla, Murcia, España ³ Instituto de Fisiologia, Instituto de Medicina Molecular, Universidade de Lisboa, Lisbon, Portugal	10:30 AM – 10:50 AM
36	<u>Pablo Franco-Rosado</u> ^{1,2,3} , M. Amparo Callejón ^{3,4} , Javier Reina-Tosina ³ , Laura M. Roa ³ , Juan F	Dose and inter-subject variability analysis for anodal tDCS stimulation over	¹ Unidad de Trastornos del Movimiento, Servicio de Neurología y Neurofisiología Clínica, Instituto de Biomedicina de Sevilla, Hospital Universitario Virgen del Rocío/CSIC/Universidad de Sevilla, Seville, Spain	10:50 AM – 11:10 AM

	<p>Martin-Rodriguez^{1,2,5}, Pablo Mir^{1,2,5} pfranco-ibis@us.es</p>	<p>motor cortical network</p>	<p>²Centro de Investigación Biomédica en Red sobre Enfermedades Neurodegenerativas, Madrid, Spain ³Grupo de Ingeniería Biomédica, Escuela Técnica Superior de Ingeniería, Seville, Spain ⁴Servicio de Otorrinolaringología, Hospital Universitario Virgen Macarena, Seville, Spain ⁵Departamento de Psicología Experimental, Universidad de Sevilla, Seville, Spain ⁶Departamento de Medicina, Facultad de Medicina, Universidad de Sevilla, Seville, Spain</p>	
<p>Questions to presenters, coffee break. Please consider asking more detailed questions offline.</p>				<p>11:10 AM – 11:15 AM</p>

Session IX: Development and Assessment of Modeling Methods

Friday Aug. 18, 2023, In person and online presentations

Chair: Manas Rachh (Ctr. for Comp. Mathematics, Flatiron Institute, NYC),

mrachh@flatironinstitute.org, Zhi-De Deng (NIH/NIMH), zhi-de.deng@nih.gov

#	Presenters/email	Title	Organization	EST (USA)
37	<p><u>William A Wartman</u>^{1,2}, Konstantin Weise^{3,4}, Manas Rachh⁵, Leah Morales¹, Zhi-De Deng⁶, Aapo Nummenmaa⁷, Sergey N Makaroff^{1,7}</p>	<p>An Adaptive H-Refinement Method for the Boundary Element Fast Multipole Method for Quasi-static Electromagnetic Modeling</p>	<p>¹ECE Dept., Worcester Polytechnic Inst., Worcester, MA USA ²The MathWorks, Inc., Natick, MA USA ³Max Planck Inst. for Human Cognitive and Brain Sciences, Leipzig, Germany ⁴Dept. of Clinical Medicine, Aarhus Univ., Aarhus, Denmark ⁵Center for Computational Mathematics, Flatiron Inst., New York, NY USA ⁶Computational Neurostimulation Research Program, Noninvasive Neuromodulation Unit, Experimental Therapeutics & Pathophysiology Branch, National Inst. of Mental Health Intramural Research Program, National Institutes of Health, Bethesda, MD, USA ⁷Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston, MA USA</p>	<p>11:15 AM – 11:33 AM</p>
38	<p><u>Mathias Davids</u> mathias.davids@mgh.harvard.edu</p>	<p>New Huygens surface-based modeling approach to peripheral nerve stimulation</p>	<p>Athinoula A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital, Boston MA USA</p>	<p>11:33 AM – 11:51 AM</p>
39	<p><u>Yvonne Buschermöhle</u>^{1,2}, Malte Höltershinken¹, Tim Erdbrügger¹, Jan-Ole Radecke^{3,4}, Andreas Sprenger^{4,5,6}, Till R. Schneider⁷, Rebekka Lencer^{2,3,4,8}, Joachim</p>	<p>Comparing the performance of beamformer algorithms in estimating orientations of neural sources</p>	<p>¹Inst. for Biomagnetism and Biosignalanalysis, Univ. of Münster, Münster, Germany. ²Otto Creutzfeldt Center for Cognitive and Behavioral Neuroscience, Univ. of Münster, Münster, Germany ³Dept. of Psychiatry and Psychotherapy, Univ. of Lübeck, Lübeck, Germany</p>	<p>11:51 AM – 12:09 PM</p>

	Gross ^{1,2} , Carsten H. Wolters ^{1,2} yvonne.buschermoehle@uni-muenster.de		⁴ Center of Brain, Behavior and Metabolism, Univ. of Lübeck, Lübeck, Germany ⁵ Dept. of Neurology, Univ. of Lübeck, Lübeck, Germany ⁶ Inst. of Psychology II, Univ. of Lübeck, Lübeck, Germany ⁷ Dept. of Neurophysiology and Pathophysiology, Univ. Medical Center Hamburg- Eppendorf, Hamburg, Germany ⁸ Inst. of Translational Psychiatry, Univ. of Münster, Münster, Germany	
40	M.Amparo Callejón-Leblic ^{1,2,3} , A. Fratter ⁴ , F. Ropero-Romero ² , J. Reina-Tosina ³ , S. Sánchez-Gómez ² mcallejon@us.es	A full head model to analyze intra and extra-cochlear electric currents under different cochlear implant stimulation strategies	¹ Oticon Medical, Madrid, Spain ² Virgen Macarena Univ. Hospital, ENT Service, Seville, Spain ³ Biomedical Engineering Group, Univ. of Seville, Seville, Spain ⁴ Oticon Medical, Vallauris, France	12:09 PM – 12:27 PM
	Questions to presenters, lunch (US)/dinner (Europe) <i>Software talk over the lunch:</i> 41. Haowen Wei, Columbia Univ. (hw2892@columbia.edu) PhysioLabXR: A software platform in Python for multi-modal brain-computer interface and real-time experiment pipelines (Zoom, 12:40 PM – 13:00 PM)			12:27 PM – 13:00 PM

Session X: WPI Research: Analyzing Functional and Structural MRI Data for Rehabilitation and Diagnosis

Friday Aug. 18, 2023, In person and online presentations

Chair: Padma Sundaram (Massachusetts General Hospital), padma@nmr.mgh.harvard.edu, Aapo Nummenmaa (Massachusetts General Hospital), nummenma@nmr.mgh.harvard.edu

#	Presenters/email	Title	Organization	EST (USA)
42	Tess B. Meier, Christopher J. Nycz, Gregory S. Fischer tbmeier@wpi.edu	Studying brain activation during exoskeleton-facilitated hand movement using fMRI at the intersection of assistance and rehabilitation	Robotics Engineering, Worcester Polytechnic Inst. USA	13:00 PM – 13:20 PM
43	Justin J. Polcari ¹ , Ryan J. Cali ² , Benjamin C. Nephew ¹ , Frances Saadeh ³ , Eric Loucks ³ , Jean A. King ¹ bnephew@wpi.edu	A mindfulness intervention for hypertension alters resting state functional connectivity networks	¹ Dept. of Biology and Biotechnology, Worcester Polytechnic Inst., Worcester, Massachusetts USA ² Dept. of Neurology, Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts USA	13:20 PM – 13:40 PM

			³ Dept. of Behavioral and Social Sciences, Brown Univ., Providence, Rhode Island USA	
44	<u>Sarah Semy</u> , Senbao Lu, Benjamin Nephew bnephew@wpi.edu	Enhancing timely detection of Alzheimer's dementia and mild cognitive impairment using a deep learning model and structural MRIs	Worcester Polytechnic Inst., Worcester, Massachusetts USA	13:40 PM – 14:00 PM
	Questions to presenters, coffee break			14:00 PM – 14:10 PM

Session XI: Modeling Transcranial Focused Ultrasound

Friday Aug. 18, 2023, In person and online presentations

Chair: Mohammad Daneshzand (Massachusetts General Hospital), mdaneshzand@mgh.harvard.edu

#	Presenters/email	Title	Organization	EST (USA)
45	<u>Thiago P. Maffei</u> Dardis ¹ , Bastien Guérin ^{2,3} tmaffeidardis@mgh.harvard.edu	A general deep learning ultrasound solver for real-time tFUS navigation in individualized skull models	¹ ESPCI Paris, PSL Research University, Paris, France ² A. A. Martinos Center for Biomedical Imaging, Department of Radiology, Massachusetts General Hospital, Charlestown, Massachusetts, USA ³ Harvard Medical School, Boston, Massachusetts, USA	14:10 PM – 14:30 PM
46	<u>Evgenii Kim</u> , Wonhye Lee ekim73@bwh.harvard.edu	Localized Drug Plasma Protein Unbinding through Transcranial Focused Ultrasound	Brigham and Women's Hospital, Boston MA USA	14:30 PM – 14:50 PM
	Questions to presenters, coffee break			14:50 PM – 15:00 PM

Session XII: High-Frequency Modeling

Friday Aug. 18, 2023, In person and online presentations

Chair: James Brown, Micro Systems Engineering, Inc., james.brown@biotronik.com, Alexander Prokop, Dassault Systèmes Deutschland GmbH, alexander.prokop@3ds.com

#	Presenters/email	Title	Organization	EST (USA)
47	James E. Brown, Paul J. Stadnik, Jeffrey A. Von Arx, Dirk Muessig, james.brown@biotronik.com	Evaluating the probability of MRI RF-induced unintended stimulation for an implantable loop recorder	Micro Systems Engineering, Inc., Lake Oswego, OR USA	15:00 PM – 15:20 PM
48	<u>Peter J. Serano</u> Donata Gierczycka pete.serano@ansys.com	Full-body detailed Toyota human model for radio-frequency simulations in Ansys Electronics Desktop	Ansys, Inc, Canonsburg, PA USA,	15:20 PM – 15:40 PM

49	Gregory M. Noetscher, Peter Serano gregn@wpi.edu	A new FDA MDDT tool for implant heating modeling	ECE Dept., Worcester Polytechnic Inst., Worcester MA USA, NEVA Electromagnetics, LLC, Holden MA USA	15:40 PM – 16:00 PM
Questions to presenters, coffee break				16:00 PM – 16:10 PM
<i>Announcement of Student Competition Winners</i>				16:10 PM – 16:20 PM