Moritz Helmstaedter

Prof. Dr. med., Dipl.-Phys.
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Education, Professional Experience

08/2014-present	Director at the Max Planck Institute for Brain Research, Frankfurt, Germany and Scientific Member of the Max Planck Society.
2011-2014	Group leader and Principal Investigator at the Max Planck Institute of Neurobiology, Munich, Germany.
2006-2011	Scientist (Postdoctoral fellow) at the Max Planck Institute for Medical Research, Heidelberg, Germany, Laboratory of Dr. Winfried Denk.
05-08/2006	Associate intern, McKinsey & Co., Stuttgart, Germany.
2001-2007	Doctoral thesis at the Max Planck Institute for Medical Research, Heidelberg, Germany, Laboratory of Dr. Bert Sakmann *(summa cum laude, issued 01/2010).*
1998-2007	Medical school, Ruprecht-Karls-University Heidelberg, Germany. *Approbation* (Medical license) 01/2008. Specialization during the practical year: Neurology.
1998-2006	*Diplom* (M.Sc.) in Physics, Ruprecht-Karls-University Heidelberg, Germany.

Scholarships, Awards, Offers

2024	Gottfried Wilhelm Leibniz Prize
09/2016-present	Professor (Chair, extraordinary professor) for Neuronal Networks at Radboud University, Nijmegen, Netherlands
2014	Professor of Neuroinformatics offer (succession Prof. Rodney Douglas), ETH Zurich (declined)
2013	Bernard Katz Lecture
2011	Lab head offer, HHMI-Janelia Farm Research Campus, Ashburn, Virginia (declined)
2011	PI offer, NINDS/NIH, Bethesda, Maryland (declined)
2009	Otto Hahn Medal awarded by the Max Planck Society
1998-2006	German National Academic Merit Foundation (*Studienstiftung des Deutschen Volkes*), full scholarship

Professional Activities

Member of the Life Science Commission, National Academy Leopoldina, Germany (since 2023)
Member of Expert Committee on Brain organoids, National Academy Leopoldina, Germany (2020-22)
Member of the Foundation Board, Peace Prize of the German Book Trade (since 2020)
Member of the Intersectional Board, Max Planck Society (since 2019)
Member of the Perspective Committee, Biomedical Section, Max Planck Society (2017-2022)
Speaker of IMPRS of Neural Circuits, Max Planck Institute for Brain Research, Frankfurt (2020-present)
Managing Director, Max Planck Institute for Brain Research, Frankfurt (rotating tenure, 2017-2020)

Peer reviewer:
Boehringer-Ingelheim Foundation, Biophysical Journal, Cell, Cerebral Cortex, Deutscher Akademischer Austauschdienst (DAAD), Deutsche Forschungsgemeinschaft (DFG), eLife (Board of reviewing editors, 2017- 2020), The Journal of Neuroscience, Molecular Psychiatry, MRC, Nature, Nature Biotechnology, Nature Communications, Nature Methods, Nature Neuroscience, Nature Reviews Neuroscience, Neuroinformatics, NIH, PLoS Computational Biology, PLoS One, Science, Swiss National Science Foundation, The Wellcome Trust, The Knut and Alice Wallenberg Foundation.

Max Planck Director selection committees, Max Planck Research Group Leader selection committees; Chair of neuroscience selection panel for Max-Planck-wide group leaders (2016-2020), Lise-Meitner Groups Selection panel (2018-2020); German National Academic Merit Foundation (2008-2014).

Advisory committees:

Member of the Scientific Advisory Board of the Biomedical Big Data Center, CAS-MPG Partner Institute of Computational Biology, Chinese Academy of Science (since 2018), Ad-hoc advisor, Janelia Farm Research Campus, HHMI (2016, 2020); Member of the Research Council Goethe University (2018-2020); Ad-hoc advisor, LMB Cambridge (2022);

Publications

Research Articles (key publications in bold)

Schmidt M, Motta A, Sievers M, Helmstaedter M (2022) RoboEM: automated 3D flight tracing for synaptic-resolution connectomics. bioRxiv 2022.09.08.507122

Song K, Feng Z, Helmstaedter M (2023) High-contrast en-bloc staining of mouse whole-brain and human brain samples for EM-based connectomics. *Nature Methods* 20, 836-840

Hua Y, Loomba S, Pawlak V, Voit KM, Laserstein P, Boergens KM, Wallace DJ, Kerr JND, Helmstaedter M (2022) Connectomic analysis of thalamus-driven disinhibition in cortical layer 4. *CellReports* 41, 111476

Loomba S, Straehle J, Ganghadharan V, Heike N, Khalifa A, Motta A, Ju N, Sievers M, Gempt J, Meyer HS, Helmstaedter M (2022) Connectomic comparison of mouse and human cortex. *Science* 377, 171 doi: 10.1126/science.abo0924

Gour A, Boergens KM, Heike N, Hua Y, Laserstein P, Song K, Helmstaedter M (2021) Postnatal connectomic development of inhibition in mouse barrel cortex. *Science* 371, 484 doi: 10.1126/science.abb4534

Klinger E, Motta A, Marr C, Theis J, Helmstaedter M (2021) Cellular connectomes as arbiters of local circuit models in the cerebral cortex. *Nature Communications* 12(1):2785. doi: 10.1038/s41467-021-22856-z.

Karimi A, Odenthal J, Drawitsch F, Boergens KM, Helmstaedter M (2020) Cell-type specific innervation of cortical pyramidal cells at their apical tufts. *eLife* 2020;9:e46876 doi:10.7554/eLife.46876

Motta A, Berning M, Boergens KM, Staffler B, Beining M, Loomba S, Schramm C, Hennig P, Wissler H, Helmstaedter M (2019) Dense connectomic reconstruction in layer 4 of the somatosensory cortex. *Science* 366, 1093 doi: 10.1126/science.aay3134 *(Cover article)*.

Drawitsch F, Karimi A, Boergens KM, Helmstaedter M (2018) FluoEM, virtual labeling of axons in 3-dimensional electron microscopy data for long-range connectomics. *eLife* doi:10.7554/eLife.38976.

Schmidt H, Gour A, Straehle J, Boergens KM, Brecht M, Helmstaedter M (2017) Axonal synapse sorting in medial entorhinal cortex. *Nature* 28;549(7673):469-475.

Boergens KM, Berning M, Bocklisch T, Bräunlein D, Drawitsch F, Frohnhofen J, Herold T, Otto P, Rzepka N, Werkmeister DW, Wiese G, Wissler H, Helmstaedter M (2017) webKnossos: Efficient Online 3D Data Annotation for Connectomics. *Nature Methods 14(7): 691-694.*

Staffler B, Berning M, Boergens KM, Gour A, van der Smagt P, Helmstaedter M (2017) SynEM, automated synapse detection for connectomics. *eLife*, doi: 10.755/elife.26414.

Berning M, Boergens KM, <u>Helmstaedter M</u> (2015) SegEM: Efficient Image Analysis for High-Resolution Connectomics. *Neuron* 87(6):1193-206 *(Cover article).*

Hua Y, Laserstein P, <u>Helmstaedter M</u> (2015) Large-volume en-bloc staining for electron microscopy-based connectomics. *Nature Communications* 6:7923.

Hoffmann JH, Meyer HS, Schmitt AC, Straehle J, Weitbrecht T, Sakmann B, <u>Helmstaedter M</u> (2015) Synaptic Conductance Estimates of the Connection Between Local Inhibitor Interneurons and Pyramidal Neurons in Layer 2/3 of a Cortical Column. *Cerebral Cortex* 25(11):4415-29.

Koelbl C, <u>Helmstaedter M</u>, Lübke J, Feldmeyer D (2013) A barrel related interneuron in layer 4 of rat. Somatosensory cortex with a high intrabarrel connectivity. *Cerebral Cortex* 25(3):713-25.

<u>Helmstaedter M</u>, Briggman KL, Turaga S, Jain V, Seung HS, Denk W (2013) Connectomic reconstruction of the inner plexiform layer in the mouse retina. *Nature* 500: 168-174.

Egger R, Narayanan RT, <u>Helmstaedter M</u>, de Kock CP, Oberlaender M (2012) 3D Reconstruction and Standardization of the Rat Vibrissal Cortex for Precise Registration of Single Neuron Morphology. *PLoS Comput Biol* 8(12):e1002837.

Andres B, Koethe U, Kroeger T, <u>Helmstaedter M</u>, Briggman KL, Denk W, Hamprecht FA (2012) 3D segmentation of SBFSEM images of neuropil by a graphical model over supervoxel boundaries. *Medical Image Analysis* 16:796-805.

Oberlaender M, de Kock CP, Bruno RM, Ramirez A, Meyer HS, Dercksen VJ, <u>Helmstaedter M</u>, Sakmann B (2012) Cell Type-Specific Three-Dimensional Structure of Thalamocortical Circuits in a Column of Rat Vibrissal Cortex. *Cerebral Cortex* 22(10):2375-91.

Meyer HS, Schwarz D, Wimmer VC, Schmitt AC, Kerr JN, Sakmann B, <u>Helmstaedter M</u> (2011) Inhibitory interneurons in a cortical column form hot zones of inhibition in layers 2 and 5A. *Proceedings of the National Academy of Sciences (PNAS)* 108:16807-16812.

<u>Helmstaedter M</u>, Briggman KL, Denk W (2011) High-accuracy neurite reconstruction for high-throughput neuroanatomy. *Nature Neuroscience* 14:1081-1088 featured in "High-throughput anatomy: Charting the brain's networks" *Nature* 490:293–298.

Briggman KL, <u>Helmstaedter M</u>, Denk W (2011) Wiring specificity in the direction-selectivity circuit of the mammalian retina. *Nature* 471:183-188.

Meyer HS, Wimmer VC, Hemberger M, Bruno RM, de Kock CP, Frick A, Sakmann B, <u>Helmstaedter M</u> (2010) Cell Type-Specific Thalamic Innervation in a Column of Rat Vibrissal Cortex. *Cerebral Cortex* 20:2287-2303 *(Cover article).*

Meyer HS, Wimmer VC, Oberlaender M, de Kock CP, Sakmann B, <u>Helmstaedter M</u> (2010) Number and Laminar Distribution of Neurons in a Thalamocortical Projection Column of Rat Vibrissal Cortex. *Cerebral Cortex* 20:2277-2286.

Turaga S, Murray J, Jain V, Roth F, <u>Helmstaedter M</u>, Briggman KL, Denk W, Seung HS (2010) Convolutional networks can learn to generate affinity graphs for image segmentation. *Neural Computation* 22:511-538.

<u>Helmstaedter M</u>, Sakmann B, Feldmeyer D (2009) L2/3 interneuron groups defined by multiparameter analysis of axonal projection, dendritic geometry, and electrical excitability. *Cerebral Cortex* 19:951-962.

<u>Helmstaedter M</u>, Sakmann B, Feldmeyer D (2009) The relation between dendritic geometry, electrical excitability, and axonal projections of L2/3 Interneurons in rat barrel cortex. *Cerebral Cortex* 19:938-950.

Helmstaedter M, Sakmann B, Feldmeyer D (2009) Neuronal correlates of local, lateral, and translaminar inhibition with reference to cortical columns. *Cerebral Cortex* 19:926-937. (*Cover article*).

Helmstaedter M, Staiger JF, Sakmann B, Feldmeyer D (2008) Efficient recruitment of layer 2/3 interneurons by layer 4 input in single columns of rat somatosensory cortex. *Journal of Neuroscience* 28:8273-8284.

Frick A, Feldmeyer D, Helmstaedter M, Sakmann B (2008) Monosynaptic connections between pairs of L5A pyramidal neurons in columns of juvenile rat somatosensory cortex. *Cerebral Cortex* 18:397-406.

Schaefer AT*, Helmstaedter M*, Schmitt AC, Bar-Yehuda D, Almog M, Ben-Porat H, Sakmann B, Korngreen A (2007) Dendritic voltage-gated K+ conductance gradient in pyramidal neurones of neocortical layer 5B from rats. *Journal of Physiology* 579:737-752. *equally contributing*

Schaefer AT, Helmstaedter M, Sakmann B, Korngreen A (2003) Correction of conductance measurements in non-space-clamped structures: 1. Voltage-gated K+ channels. *Biophysical Journal* 84:3508-3528.

Reviews, Perspectives

Abbott LF, Bock DD, Callaway EM, Denk W, Dulac C, Fairhall AL, Fiete I, Harris KM, Helmstaedter M, Jain V, Kasthuri N, LeCun Y, Lichtman JW, Littlewood PB, Luo L, Maunsell JHR, Reid RC, Rosen BR, Rubin GM, Sejnowski TJ, Seung HS, Svoboda K, Tank DW, Tsao D, Van Essen DC (2020) The mind of a mouse. *Cell* 182(6):1372-1376

Yuste R, Hawrylycz M, Aalling N, Aguilar-Valles A, Arendt D, Arnedillo RA, Ascoli GA, Bielza C, Bokharaie V, Bergmann TB, Bystron I, Capogna M, Chang Y, Clemens A, de Kock CPJ, DeFelipe J, Dos Santos SE, Dunville K, Feldmeyer D, Fiáth R, Fishell GJ, Foggetti A, Gao X, Ghaderi P, Goriounova NA, Güntürkün O, Hagihara K, Hall VJ, Helmstaedter M, Herculano S, Hilscher MM, Hirase H, Hjerling-Leffler J, Hodge R, Huang J, Huda R, Khodosevich K, Kiehn O, Koch H, Kuebler ES, Kühnemund M, Larrañaga P, Lelieveldt B, Louth EL, Lui JH, Mansvelder HD, Marin O, Martinez-Trujillo J, Moradi Chameh H, Nath A, Nedergaard M, Němec P, Ofer N, Pfisterer UG, Pontes S, Redmond W, Rossier J, Sanes JR, Scheuermann R, Serrano-Saiz E, Steiger JF, Somogyi P, Tamás G, Tolias AS, Tosches MA, García MT, Vieira HM, Wozny C, Wuttke TV, Yong L, Yuan J, Zeng H, Lein E. (2020) A community-based transcriptiomics classification and nomenclature of neocortical cell types. *Nature Neuroscience* doi: 10.1038/s41593-020-0685-8

Motta A, Schurr M, Staffler B, Helmstaedter M (2019) Big data in nanoscale connectomics, and the greed for training labels. *Current Opinion Neurobiology* 55:180-187. doi: 10.1016/j.conb.2019.03.012.

Amit I, Baker D, Barker R, Berger B, Bertozzi C, Bhatia S, Biffi A, Demichelis F, Doudna J, Dowdy SF, Endy D, Helmstaedter M et al. (2016) Voices of biotech. *Nature Biotechnology* 34, 270-275.

Borst A, Helmstaedter M (2015) Common circuit design in fly and mammalian motion vision. *Nature Neuroscience* 18:1067-1076.

Helmstaedter M, (2015) The mutual inspirations of machine learning and neuroscience. *Neuron* 86(1):25-28.

Helmstaedter M (2013) Cellular-resolution connectomics: challenges of dense neural circuit reconstruction. *Nature Methods* 10:501-507 in Feature on Brain Mapping.

Denk W, Briggman KL, Helmstaedter M (2012) Structural neurobiology: missing link to a mechanistic understanding of neural computation. *Nature Reviews Neuroscience* 13:351-358.

Helmstaedter M, Mitra PP (2012) Computational methods and challenges for large-scale circuit mapping. *Current Opinion in Neurobiology* 22:162-169.

Kleinfeld D, Bharioke A, Blinder P, Bock DD, Briggman KL, Chklovskii DB, Denk W, Helmstaedter M, Kaufhold JP, Lee WC, Meyer HS, Micheva KD, Oberlaender M, Prohaska S, Reid RC, Smith SJ, Takemura S, Tsai PS, Sakmann B (2011) Large-scale automated histology in the pursuit of connectomes *Journal of Neuroscience* 31:16125-16138.

Helmstaedter M, Briggman KL, Denk W (2008) 3D structural imaging of the brain with photons and electrons. *Current Opinion in Neurobiology* 18:633-641.

Ascoli GA, Alonso-Nanclares L, Anderson SA, Barrionuevo G, Benavides-Piccione R, Burkhalter A, Buzsaki G, Cauli B, Defelipe J, Fairen A, Feldmeyer D, Fishell G, Fregnac Y, Freund TF, Gardner D, Gardner EP, Goldberg JH, Helmstaedter M, Hestrin S, Karube F, Kisvarday ZF, Lambolez B, Lewis DA, Marin O, Markram H, Munoz A, Packer A, Petersen CC, Rockland KS, Rossier J, Rudy B, Somogyi P, Staiger JF, Tamas G, Thomson AM, Toledo-Rodriguez M, Wang Y, West DC, Yuste R (2008) Petilla terminology: nomenclature of features of GABAergic interneurons of the cerebral cortex. *Nature Reviews Neuroscience* 9:557-568.

Helmstaedter M, de Kock CP, Feldmeyer D, Bruno RM, Sakmann B (2007) Reconstruction of an average cortical column in silico. *Brain Research Reviews* 55:193-203.

Book chapters

Parag T, Berger D, Kamentsky L, Staffler B, Wei D, Helmstaedter M, Lichtman J, Pfister H (2019) Detecting Synapse Location and Connectivity by Signed Proximity Estimation and Pruning with Deep Nets. Springer doi: 10.1007/978-3-030-11024-6_25

Boergens K, Berning M, Helmstaedter M (2016) Dendritic connectomics in: Dendrites (eds Stuart, *Spruston, Häusser) 3rd ed. Oxford University Press, p. 623-638.*

Helmstaedter M, Feldmeyer D (2010) Axons predict neuronal connectivity within and between cortical columns and serve as primary classifiers of interneurons in a cortical column. in: New aspects of axonal structure and function (Feldmeyer D, Lubke JHR, ed.). Springer New York, p. 141-155.

Patent

Seung HS, Murray JF, Jain V, Turaga SC, Helmstaedter M, Denk W. Method and apparatus for image processing. Patent No. US20100183217A1.

Invited presentations

2024 European Microscopy Congress 2024, Copenhagen, Denmark | GRC - Thalamocortical Interactions, Ventura, USA | IPAM MAC2024, UCLA, USA | KIST-BSI seminar 2024, Seoul, Korea **2023** The great brain exploration conference, Beijing, China | EAI Workshop Mainz University, Germany| Brainmodes Conferece, UKE Hamburg, Germany | CAT Workshop Goteborg, Sweden | NNH, Bethesda, USA | King's College, London, UK | HHMI Janelia Conference Beyond the Connectome, Ashburn, USA | Future Science Forum Shanghai, China | Volume Electron Microscopy Gordon Research Conference, Ventura, USA | HHMI Janelia Conference on Neural Circuit Assembly, Ashburn, USA | European College of Neuropsychopharmacology, Nice | VIB, Leuven, Belgium | UCL – NeuroDataShare 2023, London, UK | Weizmann Institute, Israel | Institute of Neuroscience, CAS, Shanghai | Physics of Thought, MPG Berlin **2022** Keynote Curious 2022 – Future Insight Conference, MERCK Darmstadt, Germany | Brainy Days, Hebrew University Jerusalem | NIH | Ascona Circuits Conference | Oslo university | Nature conference on AI and Brain, Bonn | ISTA Vienna | Connectomics meeting, Berlin (also organizer) | Molecular Medicine Lecture, Goethe University Frankfurt | BaCoFun, Lausanne, Switzerland **2021** Keynote 115. Kongress der Anatomischen Gesellschaft Innsbruck, Austria | McGovern-Peking University Neuroscience Conference | Janelia-MRC-Sister Institute Seminar **2020** World-wide Neuro talk | UCL | Universität Tübingen, Germany **2019** 9th Optic Nerve Meeting, Obergurgl, Austria | European Institute for Theoretical Neuroscience, Paris, France | Keynote FUTURAS IN RES Conference, Berlin, Germany | Keynote Swiss Innovation Forum, Basel, Switzerland | Future of Trust Summit, Frankfurt, Germany | Peking University International Brain Research Forum, Beijing, China | 2nd SD Center-Yanqihu 2019 Neuroscience Challenge, Beijing,

China | Keynote Systems Neuroscience Symposium, Luxembourg | 2nd International Conference for Neuron Reconstruction and Applications, Nanjing, China | Colloquium Tübingen University | Ulm University Imaging Center, Ulm, Germany | Instituto de Neurociencias, Alicante, Spain | SCANDEM 2019, Göteborg, Sweden | Excitatory Synapses and Brain Function Gordon Research Conference, Maine, USA | MPI-CBG Dresden, Germany | AI for Good Global Summit, Geneva, Switzerland | Darwin's Circle Health, Vienna, Austria | Keynote 2nd Merck Data Science Conference, Frankfurt, Germany | Keynote Rise of AI Conference 2019, Berlin, Germany | DZNE Opening Symposium, Dresden, Germany | Shanghai Institute of Precision Medicine, Shanghai, China | Max Planck/HHMI Connectomics Conference (co-organizer), Berlin, Germany | Masters of Digital 2019, Brussels, Belgium | MPI Florida Science meets Music Lecture and Concert, Palm Beach, USA **2018** Max Planck Meeting Valparaiso, Chile | Dagstuhl Seminar, Wadern, Germany | Big Data in the Biosciences, Berlin, Germany | 2nd Sino-German Symposium *Development and Maintenance of Brain Function: From Basic Mechanisms to Disease*, Berlin, Germany | 2nd Peking University International Neuroimaging (PUIN), Beijing, China | Brain Conference Copenhagen, Denmark | Max Planck Symposium *Frontiers in Bioscience*, Buenos Aires, Argentina | Plenary Speaker INCF Congress on Neuroinformatics, Montreal, Canada | Peking University, Beijing, China | Japan Neuroscience Meeting 2018, Kobe, Japan | Keynote FENS Satellite Symposium Berlin, Germany | Connectomics Conference Janelia Farm, Ashburn, USA | Leopoldina and IAS Symposium *From Synapses to Circuits in Health and Disease*, Berlin, Germany **2017** DFN, Bonn, Germany | Karlsruhe Institute for Technology (KIT), Karlsruhe, Germany | Bernstein Conference 2017, Goettingen, Germany | Leopoldina Symposium, Halle, Germany | Physics Symposium Radboud University, Nijmegen, Netherlands | Brain Connectivity Workshop 2017, Zurich University and ETH Zurich, Switzerland | DIPP PhD Retreat of the Dresden International PhD Program, Berlin, Germany | 10th Student Symposium on Molecular Medicine, Ulm University, Germany | Max Planck/HHMI Connectomics Conference (co-organizer), Berlin, Germany | Gordon Research Conference on Dendrites, Lucca, Italy | Keystone Symposium on Connectomics, Santa Fe, USA | BCCN, Berlin, Germany **2016** Connectomics Workshop NIPS Barcelona, Spain | Leopoldina and Israel Academy of Sciences and Humanities Inter-Academy Symposium Jerusalem, Israel | Second Max Planck Symposium, Buenos Aires, Argentina | Physical Colloquium Halle University, Germany | CSH Asia Meeting, Shanghai, China | Keynote Annual Meeting of the German Anatomical Society, Goettingen, Germany | University Heidelberg, Germany | Symposium *Frontiers in Network Science*, Hamburg, Germany | rmn2 Frankfurt/Mainz, Germany | SCANDEM, Trondheim, Norway | Colloquium Max Planck Institute for Plasma Physics, Garching, Germany | Keynote *Barrel Cortex Function* Amsterdam 2016, Netherlands | Saarbruecken University, Germany | Connectomics conference Janelia Farm, Ashburn, USA | Research Data Alliance Europe, Amsterdam, Netherlands | Keynote Annual Meeting Clinical Neuroscience, Bern, Switzerland | Crick Centenary Symposium, Columbia and Rockefeller Universities, New York, USA | CAS Tandem Lecture: Quantitative Network Science, LMU Munich, Germany **2015** University of Helsinki, Finland | MPG-CAS ERTC *Big Data*, CAS, Shanghai, China | Chinese-German Meeting "Brain Development: Basic mechanisms and diseases", CAS, Beijing, China | 5th Neuroscience Symposium, Cambridge, UK | Keynote Talk Symposium *"Cutting-edge Technologies in Life Science"*; Martinsried, Germany | *Psychiatry Colloquium*, Ulm University, Germany | *Oxford University Cortex Club*, UK | *Physics Colloquium*, Duisburg University, Germany | Vollum Institute Portland, USA | Keynote Speaker Annual Winter Conference, Soelden, Austria | Keynote Talk Forschungszentrum Juelich, Germany | Annual Meeting German Physical Society, Berlin, Germany | Lecture at Pasteur Institute, Paris, France | Plenary lecture, Annual Meeting Swiss Society for Neuroscience, Fribourg, Switzerland **2014** BMFZ Heine University Düsseldorf, Germany | Brain Mind Institute, EPFL, Lausanne, Switzerland | Plenary lecture, Meeting of the Italian Physiological Society - Isle of Capri, Italy | Google Sci Foo 2014, Mountain View, USA | Harvard University, Boston, USA | HHMI/Max Planck connectomics conference (co-organizer), Berlin, Germany | Gordon Research Conference Synaptic Transmission, New Hampshire, USA | Microscience and Microscopy Congress, Manchester, UK | Jacques-Monod-Conference, Roscoff, France | CNCR Institute, VU University, Amsterdam, Netherlands | Workshop Physical, Engineering, and Biological Limits to Brain Measurements, Arlington, USA | Microscopy club, Laser Laboratory, Goettingen, Germany | Collaborations in Neuroscience Symposium, Max Planck Florida Institute for Neuroscience, Jupiter, USA | Max Planck Institute of Psychiatry, Munich, Germany | Annual Meeting Pro-Retina Foundation, Potsdam, Germany | Workshop Analyzing neural circuits and control theory, Cold Spring Harbor Laboratory, USA | Department of Diagnostic Radiology, University Freiburg, Germany | Institute seminar, Max Planck Florida Institute for Neuroscience, Jupiter, USA | Max Planck Meeting, Valparaiso, Chile **2013** MPI for Biological Cybernetics, Tuebingen, Germany | NERF Neurotechnology Symposium, Leuven, Belgium | Workshop *Physical and Mathematical Principles of Brain Structure and Function*, NSF, Arlington, USA | Workshop *Visualization*

in Medicine and Life Sciences, Leipzig, Germany | Gatsby Unit, UCL, London, UK | Microscopy & Microanalysis Conference, Indianapolis, USA | Max Planck Institute for Brain Research, Frankfurt, Germany | caesar Conference, Bonn, Germany | Institut de la vision, Paris, France | International Society for Magnetic Resonance in Medicine workshop, Split, Croatia | Biology and Medicine Section of the Max Planck Society Symposium, Berlin, Germany | Bernard Katz Lecture, Israel Society for Neuroscience, Eilat, Israel **2012** Bernstein Center for Computational Neuroscience, Berlin, Germany | École Supérieure de la Physique et Chimie, Paris, France | Visual Computing Workshop, German Informatics Society, Berlin, Germany | FENS Symposium (Symposium Co-chair and speaker), Barcelona, Spain | Conference *Next Generation Medical Imaging* Carnegie Mellon University, Pittsburgh, USA | Bernstein Conference, Bernstein Center Munich, Germany | European Microscopy Conference, Royal Microscopical Society, Manchester, UK | Workshop *Scaling up connectomics*, Janelia Farm Research Campus, HHMI, Ashburn, USA | Institute of Neuroinformatics, ETH Zurich, Switzerland | Allen Institute for Brain Science, Seattle, USA | Neural Information Processing Systems (NIPS) Meeting (Workshop co-organizer), Lake Tahoe, USA **2011** PANOS conference, Dortmund, Germany | Microscopy conference, Kiel, Germany | Connectomics conference, Janelia Farm Research Campus, HHMI, Ashburn, USA | NIMR, London, UK | MPG/Tokyo University meeting, Tokyo, Japan | MRC, Cambridge, UK **2010** Symposium *Cortical Column in silico*, Max Planck Florida Institute, Jupiter, USA | Conference *Neuronal Circuits*, Cold Spring Harbor Laboratory, USA | Conference *The Neural Basis of Vibrissa-Based Tactile Sensation*, Janelia Farm Research Campus, HHMI, Ashburn, USA | Berlin Colloquium on Scientific Visualization, Konrad Zuse Institute, Berlin | Monday Seminar of the Institute for Brain Research, University of Zürich, Switzerland | HHMI Janelia Farm Research Campus, Ashburn, USA | Center for Molecular and Behavioral Neuroscience, Rutgers University, New Jersey, USA | Princeton Neuroscience Institute, USA **2009** Berlin Circuit Conference HHMI/Max Planck Society, Germany | NINDS, National Institute of Health, Bethesda, USA **2008** Barrels Meeting, Johns Hopkins University, Baltimore, USA

Teaching

2023 Cajal Connectomics Course Bordeaux, France **2021** Wuerzburg Autumn school | MHH (Hannover) Philosophie und Medizin – Studenteninitiative | Studium generale Mainz | Giersch summer school Frankfurt **2019** Cajal Course on Interacting with Neural Circuits, Lisbon, Portugal **2018** Summer School Visual Neuroscience, Rauischholzhausen, Germany | Neuroscience Lecture Radboud University, Nijmegen, Netherlands **2017** Cajal School on Connectomics, Bordeaux, France | FENS-IBRO Cajal Course, Lisbon, Portugal **2016** Cajal Course in Computational Neuroscience 2016 (CCCN), Lisbon, Portugal | Donders Summer School on Neural Metrics, Nijmegen, Netherlands **2015** ACCN, Lisbon, Portugal | Donders Summer School on Neural Metrics, Nijmegen, Netherlands **2014** 3rd Latin-American Summer School in Computational Neuroscience, Valparaiso, Chile **2013** INCF sponsored course, University of Antwerp, Belgium **2012** PhD course, University Goettingen, Germany | PhD course, Karolinska Institutet, Stockholm, Sweden | PhD course, International Max Planck Research School, Muenster, Germany | Barcelona Cognition, Brain and Technology Summer School, Barcelona, Spain | *Neuroinformatics Course*, Marine Biological Laboratory, Woods Hole, USA **2011** *Neuroinformatics Course*, Marine Biological Laboratory, Woods Hole, USA | PhD course *Staromics*, Université de Fribourg, Switzerland | PhD course, University of Copenhagen, Denmark | *Workshop on Circuit & Molecular Architecture of the Vertebrate Brain,* Cold Spring Harbor Laboratory, USA **2010** *Workshop on Circuit & Molecular Architecture of the Vertebrate Brain,* Cold Spring Harbor Laboratory, USA | Horizons in Molecular Biology, Max Planck Graduate School, Goettingen, Germany **2009** Graduate seminar *Introduction to Connectomics*, MIT and Harvard University, Cambridge, USA **2008-2012** *General Human Physiology* for the introductory practical courses for 1st and 2nd year medical students at Heidelberg University Medical School, Germany

Public media coverage / Public lectures

2023 TerraX – Maithink (ZDF, filmed in 2022) **2022** Gehirninfo.org interview | FAZ | Der Spiegel | Extended feature in Wiley Microscopy and Analysis magazine | MIND University network **2021** Kortizes conference **2020** Interview public broadcasting hr (TV) | Interview public broadcasting hr (Radio) | Google Sci Foo Camp | Featured in "Probing fine-scale connections in the brain", Nature 586: 631-633 | **2019** Growing up in Science, MPI for Empirical Aesthetics, Frankfurt,

Germany | Wissenschaft trifft Kunst, Städel Museum, Frankfurt, Germany Link | GehirnDerZukunft, Frankfurt Link | hub.berlin **2018** Innovators Summit AI – from Hype to Reality, Munich, Germany | ZVEI-Jahreskongress 2018, Berlin, Germany | Latest Thinking Link **2017** SWR2 Impuls – 1000 Antworten Link | Labjournal – Journal Club Link | Frankfurter Rundschau, *Was unser Fühlen, Denken, Handeln bestimmt* Link | ICNF Frankfurt am Main | **2016** Merton-Magazin, *Masterplan für die Hirnvermessung* Link | Schule MIT Wissenschaft, Erfurt | Salongespräch Schering-Stiftung & Komische Oper, Berlin | Connectomics debate Helmstaedter – Movshon, CNS New York 2016 Link **2015** Schule MIT Wissenschaft, Braunschweig | FIAS, Frankfurt am Main | *Campus Talks*, ARD Alpha, München Link | Lange Nacht der Naturwissenschaften MK Braunschweig | **2014** BioTechniques, *Mapping Neural Connections* Link | Science, *Investments Boost Neurotechnology Career Prospects* | Science, *Connectomics at the Cutting Edge* (webinar together with Jeff Lichtman) Link | Gehirn und Geist, *Der Netzwerk-Analysator* Link | Die Welt, *So wird die Hirnforschung zu einem großen Spiel* Link | Frankfurter Allgemeine Zeitung, *Kartograph des Gehirns* | Frankfurter Rundschau, *Die Vermessung des Gehirns - Einem Mysterium auf der Spur* Link | BioTechniques, *Mapping Neural Connections* Link | *Caesarium*, Center of Advanced European Studies and Research, Bonn Link | Bild der Wissenschaft (print), Link | BRα, *Brainflight – Forschung als Spiel,* Link | *Wissenschaft für Jedermann*, Campus Martinsried, Munich | *Science meets music* public lecture, Max Planck Florida Institute for Neuroscience, Jupiter | Hebrew University/Max Planck Brain Forum: Frontiers in Brain Research, Berlin | Laborjournal, *Hirnforschung @ Home*, Link | **2013** Nature Methods, *Neuroscience waves to the crowd*, Link | Science, *This is your brain: Mapping the connectome*, Link | Stuttgarter Zeitung, *Das kartierte Gehirn*, Link | Deutschlandfunk, *Nächstes Level Großhinrinde*, Link | Wired, *Zweites Leben: Die Digitalisierung des Gehirns* | Science writers guild New York, panel discussion | Tech open air, Berlin | DasGehirn.info, *Das Labyrinth im Gehirn*, Link | Focus (print), *Freiwillige Forscher* | Rundfunk Berlin-Brandenburg, Radio interview | Economist blog, *Crowdsourced connectomics: Mind games*, Link | Focus online, *Operation Brainflight: Mit dem Flugsimulator durchs Mäusehirn*, Link | DLD Conference, Munich, *Game Based Brain Reconstruction*, Link | **2012** DER SPIEGEL, *Im Flug durch das Gehirn*, Link | Nature, *High-throughput anatomy: Charting the brain's networks*, Link | **2011** TEDx Vienna, *Brain Mapping*, Link