

# Guido T. Meijer

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## Work experience

### Donders Institute, Radboud University

*Nijmegen, The Netherlands*

POSTDOCTORAL RESEARCHER

*April 2023 - PRESENT*

- Based in the lab of Francesco Battaglia
- I perform electrophysiological recordings in mice using Neuropixel probes during behavior.

### Champalimaud Centre for the Unknown, International Brain Laboratory (IBL)

*Lisbon, Portugal*

POSTDOCTORAL RESEARCHER

*2018 - 2023*

- Large international collaboration in which I was based in the lab of Zachary Mainen.
- I did acute Neuropixel recordings in behaving mice in while optogenetically stimulating serotonin release from the dorsal raphe nucleus.
- Close collaboration with theoretical neuroscientists while performing decoding analyses using machine learning and model fitting.
- I was elected as the representative of all researchers in the collaboration twice and through that role attended Executive Board meetings.

### University of Amsterdam, Cognitive and Systems Neuroscience lab

*Amsterdam, The Netherlands*

PHD CANDIDATE

*2013 - 2017*

- Under supervision of Carien Lansink and Cyriel Pennartz.
- Developed a novel behavioral paradigm to probe multisensory integration in mice.
- Set up chronic calcium imaging of the same neural population long timescales (~ one month).

## Degrees

### University of Amsterdam

*Amsterdam, The Netherlands*

PH.D. IN NEUROSCIENCE

*2013 - 2017*

- Defended my thesis "More than meets the eye: processing of visual and auditory information in the sensory cortex" on June 5th, 2019

B.S IN PSYCHOBIOLOGY AND M.S. IN COGNITIVE NEUROSCIENCE

*2006 - 2013*

- Internship at Harvard (Boston, MA, USA) in the lab of Mark Andermann.

## Skills

### Interpersonal

- I was elected as researchers representative for two consecutive terms in the IBL collaboration, acting as a bridge between the researchers and the Executive Board
- Good collaborative writing skills: I was part of the task force that wrote the first IBL collaboration-wide publication
- Excellent mentoring skills as indicated by positive feedback from two technicians and eight interns that I supervised over the years
- I am passionate about teaching; I was a lecturer and teaching assistant in several courses at the masters level

### Experimental

- *In vivo* electrophysiological recordings using multiple Neuropixel probes in awake and behaving mice
- Optogenetic perturbation of neural activity
- Chronic *in vivo* two-photon calcium imaging and photometry over long time scales in mice
- Successfully developed several mouse behavioral paradigms
- Experience with integrating behavior, neural recordings and perturbations in a single experiment

### Analytical

- I am specialized in analyzing high-dimensional neural data using dimensionality reduction and machine-learning techniques
- I am part of multiple large collaborative coding projects using Git for code sharing
- Well versed in advanced statistical methods like permutation testing and multi-level statistics

**Programming** Python, MATLAB, R, Git, LaTeX, MySQL

# Publications

- 2025 **Serotonin drives choice-independent reconfiguration of distributed neural activity** *bioRxiv*  
Meijer, Catarino, Freitas-Silva, Laranjeira, International Brain Laboratory, and Mainen
- Reproducibility of in-vivo electrophysiological measurements in mice** *eLife*  
The International Brain Laboratory, *et al*
- Power Pixels: a turnkey pipeline for processing of Neuropixel recordings** *bioRxiv*  
Meijer and Battaglia
- 2024 **Lightning Pose: improved animal pose estimation via semi-supervised learning, Bayesian ensembling and cloud-native open-source tools** *Nature Methods*  
Biderman, Whiteway, Hurwitz, Greenspan, Lee, Vishnubhotla, Schartner, Huntenburg, Khanal, **Meijer**, Noel, Pan-Vazquez, Socha, Urai, The International Brain Laboratory, Warren, Noone, Pedraja, Cunningham, Sawtell, and Paninski
- Interactive data exploration websites for large-scale electrophysiology** *bioRxiv*  
Birman, Chapuis, Faulkner, Rossant, International Brain Laboratory, Benson, Catarino, Churchland, Hu, Huntenburg, Khanal, Krasniak, Lau, **Meijer**, Miska, Noel, Pan-Vazquez, Roth, Schartner, Socha, Steinmetz, Urai, Wells, West, Winter
- 2023 **A Brain-Wide Map of Neural Activity during Complex Behaviour** *bioRxiv*  
The International Brain Laboratory, *et al*
- Brain-wide representations of prior information in mouse decision-making** *bioRxiv*  
Findling, Hubert, International Brain Laboratory, Acerbi, Benson, Benson, Birman, Bonacchi, Carandini, Catarino, Chapuis, Churchland, Dan, DeWitt, Engel, Fabbri, Faulkner, Fiete, Freitas-Silva, Gerçek, Harris, Häusser, Hofer, Hu, Huntenburg, Khanal, Krasniak, Langdon, Latham, Lau, Mainen, **Meijer**, Miska, Mrcic-Flogel, Noel, Nylund, Pan-Vazquez, Paninski, Pillow, Rossant, Roth, Schaeffer, Schartner, Shi, Socha, Steinmetz, Svoboda, Tessereau, Urai, Wells, West, Whiteway, Winter, Witten, Zador, Dayan, and Pouget
- Dissecting the Complexities of Learning With Infinite Hidden Markov Models** *bioRxiv*  
Bruijns, International Brain Laboratory, Bougrova, Laranjeira, Lau, **Meijer**, Miska, Noel, Pan-Vazquez, Roth, Socha, Urai, Dayan
- A new family of statistical tests for neuronal spiking and autocorrelated timeseries data** *bioRxiv*  
Heimel, Meijer, Montijn
- 2021 **A standardized and reproducible method to measure decision-making in mice** *eLife*  
The International Brain Laboratory, *et al*
- Neurons in the mouse brain correlate with cryptocurrency price: a cautionary tale** *Peer Community Journal*  
Meijer
- 2020 **Neural Correlates of Multisensory Detection Behavior: Comparison of Primary and Higher-Order Visual Cortex** *Cell Reports*  
Meijer, Marchesi, Montijn, Lansink, and Pennartz
- Deep Graph Pose: a semi-supervised deep graphical model for improved animal pose tracking** *NeurIPS*  
Wu, Estefany, Buchanan, Whiteway, Schartner, **Meijer**, Noel, Rodriguez, Everett, Norovich, Schaffer, Mishra, Salzman, Angelaki, Bendesky, The International Brain Laboratory, Cunningham, and Paninski
- 2019 **The circuit architecture of cortical multisensory processing: Distinct functions jointly operating within a common anatomical network** *Progress in Neurobiology*  
Meijer, Mertens, Pennartz, Olcese, and Lansink
- Co-administration of Anti microRNA-124 and -137 Oligonucleotides Prevents Hippocampal Neural Stem Cell Loss Upon Non-convulsive Seizures** *Front in Mol Neuroscience*  
Bielefeld, Schouten, **Meijer**, Breuk, Geijtenbeek, Karayel, Tiaglik, Vuuregge, Willems, Witkamp, Lucassen, Encinas, and Fitzsimons
- 2018 **Audiovisual integration enhances stimulus detection performance in mice** *Front in Behav Neurosci*  
Meijer, Pie, Dolman, Pennartz and Lansink
- Conditioning sharpens the spatial representation of rewarded stimuli in mouse primary visual cortex** *eLife*  
Goltstein, Meijer, and Pennartz
- 2017 **Audio-visual modulation in mouse V1 depends on cross-modal stimulus configuration and congruency** *Journal of Neuroscience*  
Meijer, Montijn, Pennartz, and Lansink

2016	<b>Population-level neural codes are robust to single-neuron variability from a multidimensional coding perspective</b> Montijn*, Meijer*, Lansink, and Pennartz	<i>Cell Reports</i>
	<b>Reward expectancy strengthens CA1 theta and beta band synchronization and hippocampal-ventral striatal coupling</b> Lansink, Meijer, Lankelma, Vinck, Jackson, and Pennartz	<i>Journal of Neuroscience</i>

## Invited talks

2024-05	<b>Karolinska Institute visit</b> , Carlén lab meeting	<i>Stockholm, Sweden</i>
2023-11	<b>Neuro OpenScience Workshop</b> , "The International Brain Laboratory initiative"	<i>Paris, France</i>
2023-11	<b>VNOP Research Days</b> , Authorship and credit assignment in large collaborations	<i>Utrecht, N.L.</i>
2023-06	<b>Dutch Neuroscience Meeting</b> , Symposium "Electrophysiological investigation of large scale neural populations"	<i>Tiel, N.L.</i>
2022-03	<b>Cosyne</b> , Workshop "Understanding Variability in Neural Computations and Behaviors"	<i>Lisbon, Portugal</i>
2021-08	<b>Seminar on reproducibility in neuroscience</b> , Catholic University of Bolivia, La Paz, Bolivia	<i>Remote</i>
2021-01	<b>Webinar on data stewardship and open data</b> , Istituto Italiano di Tecnologia, Genova, Italy	<i>Remote</i>
2018-07	<b>FENS Forum</b> , Workshop "Investigating Neural Substrates of Perception and Cognition with Large-scale Data"	<i>Berlin, Germany</i>
2017-12	<b>University College London visit</b> , Carandini & Harris lab meeting	<i>London, UK</i>
2017-04	<b>Meeting "Optogenetics and other Genetic Approaches in Systems Neuroscience"</b> , Netherlands Institute for Neuroscience	<i>Amsterdam, N.L.</i>
2017-04	<b>'TED-Style' talk on optogenetics</b> , CogniTALKS	<i>Amsterdam, N.L.</i>
2016-02	<b>Science-Art collaboration 'New Realism'</b> , Rietveld Academy of Art and Design	<i>Amsterdam, N.L.</i>

## Poster presentations

2024-06	<b>FENS Forum</b> , Three posters	<i>Vienna, Austria</i>
2024-05	<b>Tools and Methods for Next Generation Electrophysiology</b>	<i>Edinburgh, UK</i>
2023-10	<b>Champalimaud Research Symposium</b>	<i>Lisbon, Portugal</i>
2022-07	<b>FENS Forum</b>	<i>Paris, France</i>
2022-03	<b>Simons Foundation meeting</b>	<i>New York, USA</i>
2021-10	<b>Champalimaud Research Symposium</b>	<i>Lisbon, Portugal</i>
2019-10	<b>SfN - Society for Neuroscience</b> , Two posters	<i>Chicago, USA</i>
2019-03	<b>Cosyne</b>	<i>Lisbon, Portugal</i>
2017-09	<b>European Visual Cortex Meeting</b>	<i>London, UK</i>
2017-11	<b>SfN - Society for Neuroscience</b>	<i>Washington, USA</i>
2015-11	<b>SfN - Society for Neuroscience</b> , Two posters	<i>Chicago, USA</i>

## Honors, Awards & Grants

2017	<b>Honorary member</b> , Student union 'Congo' for Biology, Psychobiology & Biomedical Sciences	<i>Amsterdam, N.L.</i>
2016	<b>Best talk</b> , ONWAR Graduate School for Neurosciences annual meeting	<i>Zeist, N.L.</i>
2012	<b>Bekker-la Bastide fund</b> , Internship abroad grant	

## Additional activities

2019	<b>Post-doc representative (1 yr)</b> , International Brain Laboratory	<i>Lisbon, Portugal</i>
2016	<b>Chair of the Board (2 yrs)</b> , Alumni association for Neuroscience graduates	<i>Amsterdam, N.L.</i>
2007	<b>Member of the Board (1 yr)</b> , Student union 'Congo' for Biology, Psychobiology & Biomedical Sciences	<i>Amsterdam, N.L.</i>