

# Nicholas A. Steinmetz

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## Education

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- 2007 –2014 Ph.D., Neurosciences, Stanford University, Stanford, CA, USA  
Supervisors: Prof. Tirin Moore (Neurobiology) and Prof. Kwabena Boahen (Bioengineering)
- 2003 –2007 Bachelor of Science and Engineering in Bioengineering, *summa cum laude*  
University of Pennsylvania, Philadelphia, PA, USA

## Employment

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- 2017 – present Senior Research Associate, University College London, London, UK  
Supervisors: Prof. Matteo Carandini (Ophthalmology) and Prof. Kenneth Harris (Neurology)
- 2017 – present Program coordinator, “Neuropixels 2” Wellcome Collaborative Award
- 2014 – 2017 Research Associate, University College London, London, UK

## Peer-Reviewed Publications

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- 2017 Jun J\*, **Steinmetz NA\***, Siegle JH\*, Denman DJ\*, Bauza M\*, et al. *Nature*  
[Fully Integrated Silicon Probes for High-Density Recording of Neural Activity](#)
- Burgess CP\*, Lak A\*, **Steinmetz NA\***, Zatka-Haas P\*, et al. *Cell Reports*  
[High-Yield Methods for Accurate Two-Alternative Visual Psychophysics in Head-Fixed Mice](#)
- Steinmetz NA**, Buetfering C, Lecoq J, Lee CR, et al. *eNeuro*  
[Aberrant Cortical Activity in Multiple GCaMP6-Expressing Transgenic Mouse Lines](#)
- Sridharan D, **Steinmetz NA**, Moore T, Knudsen EI *J. of Neurosci*  
[Does the Superior Colliculus Control Perceptual Sensitivity or Choice Bias during Attention? Evidence from a Multialternative Decision Framework](#)
- 2016 Engel TA\*, **Steinmetz NA\***, Gieselmann MA, Thiele A, Moore T, Boahen K *Science*  
[Selective modulation of cortical state during spatial attention](#)
- Stringer C, Pachitariu M, **Steinmetz NA**, Okun M, Bartho P, Harris K, Sahani M, Lesica N *eLife*  
[Inhibitory control of correlated intrinsic variability in cortical networks](#)
- Pachitariu M, **Steinmetz NA**, Kadir S, Carandini M, Harris KD *NIPS*  
[Fast and accurate spike sorting of high-channel count probes with KiloSort](#)
- 2015 Okun M, **Steinmetz NA**, ... Carandini M, Harris KD *Nature*  
[Diverse coupling of neurons to populations in sensory cortex](#)
- 2014 Sridharan D, **Steinmetz NA**, Moore T, Knudsen EI *J. of Vision*  
[Distinguishing bias from sensitivity effects in multialternative detection tasks](#)
- Steinmetz NA**, Moore T *Neuron*  
[Eye Movement Preparation Modulates Neuronal Responses in Area V4 When Dissociated from Attentional Demands](#)
- Steinmetz NA** *Ph.D. Thesis*  
[Circuits underlying visual attention in primate neocortex](#)
- Zirnsak M, **Steinmetz NA**, Noudoost B, Xu K, Moore T *Nature*  
[Visual space is compressed in prefrontal cortex before eye movements](#)
- 2010 **Steinmetz NA**, Moore T *J. of Neurophys*  
[Changes in the Response Rate and Response Variability of Area V4 Neurons During the](#)

## Nicholas A. Steinmetz

### Preparation of Saccadic Eye Movements

- 2009 Aton SJ, Seibt J, Dumoulin M, Jha SK, **Steinmetz N**, Coleman T, Naidoo N, Frank MG *Neuron*  
[Mechanisms of Sleep-Dependent Consolidation of Cortical Plasticity](#)
- 2008 Liu X, **Steinmetz NA**, Farley AB, Smith CD, Joseph JE *J. of Cog Neurosci*  
[Mid-fusiform activation during object discrimination reflects the process of differentiating structural descriptions](#)
- 2006 Joseph JE, Cerullo MA, Farley AB, **Steinmetz NA**, Mier CR *Neuroimage*  
[fMRI correlates of cortical specialization and generalization for letter processing](#)
- Joseph JE, Powell DK, Andersen AH, ..., **Steinmetz NA**, Zhang Z *J. of Neurosci Methods*  
[fMRI in alert, behaving monkeys: an adaptation of the human infant familiarization novelty preference procedure](#)
- 2005 Jha SK, Jones BE, Coleman T, **Steinmetz N**, ..., Frank MG *J. of Neurosci*  
[Sleep-Dependent Plasticity Requires Cortical Activity](#)

### Reviews and Commentary

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- 2017 Steinmetz NA, Harris KD, Carandini M *Curr Op in Neurobiology (in press)*  
Large-scale electrophysiology with Neuropixels probes
- 2012 Squire RF\*, **Steinmetz NA\***, Moore T *Scholarpedia*  
[Frontal Eye Fields](#)
- Steinmetz NA**, Moore T *Neuron*  
[Lumping and splitting the neural circuitry of visual attention](#)
- 2010 Noudoost B, Chang MH, **Steinmetz NA**, Moore T *Curr Op in Neurobiology*  
[Top-down control of visual attention](#)

### Fellowships and Awards

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- 2016 – pres. Postdoctoral Fellowship from the Marie Curie Action of the EU. €183,454.80.
- 2015 – 2016 Postdoctoral Fellowship from the Human Frontier Sciences Program. £93,789.
- 2015 Newton Postdoctoral Fellowship from the Royal Society (awarded). £99,000.
- 2011 – 2014 Graduate Research Fellowship from National Science Foundation (NSF GRFP)
- 2009 – 2011 Graduate Research Fellowship from the Stanford Center for Mind, Brain, and Computation, National Science Foundation, Integrative Graduate Education Research Traineeship (NSF IGERT)
- 2006 –2007 Blair Fellowship for Undergraduate Research in Bioengineering/Biomedical Sciences from the University of Pennsylvania
- 2005 –2007 University Scholars Fellowship for Undergraduate Research from the University of Pennsylvania

### Invited Talks

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- 2017 Nov SfN Neuropixels Satellite Session, Washington, DC
- 2017 Oct Kavli Futures Symposium: Neurotechnology, Santa Monica, CA
- 2017 Sept NIH Neurotechnology Seminar, Bethesda, MD
- 2017 July Computational Neuroscience Society, Antwerp, Belgium
- 2017 July Champalimaud Centre for the Unknown, Lisbon, Portugal
- 2017 June International Conference for Advanced Neurotechnology, Freiburg, Germany
- 2016 Nov Institute of Ophthalmology, University College London, London, UK
- 2015 Nov Neuroseeker Data Workshop, Nijmegen, Netherlands

### *Other Training*

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- 2012 FENS-IBRO-Hertie Winter School on “Neural Coding in Sensory Systems”, Obergurgl, Austria  
2009 “Methods in Computational Neuroscience”, Woods Hole, MA, USA

### *Teaching Activities*

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- 2017 Teaching Assistant for Cajal Course “Interacting with Neural Circuits”, Champalimaud Centre, Lisbon, Portugal  
2017 Course organizer and lecturer for Neuropixels Training Course, University College London  
2015 – pres. Mentor for graduate student Peter Zátka-Haas on the project “Manipulation of neural circuitry underlying visually-guided decision making in mice”, University College London  
2014 Mentor for rotating graduate student Isaac Kauvar on the project “Methods for computing cross-areal coherence in the primate visual system”, Stanford University  
2012 Teaching Assistant, *Large-scale neural models*, with Dr. Kwabena Boahen, Stanford University  
2011 Teaching Assistant, *Computational Neuroscience*, with Dr. John Huguenard, Stanford University  
2009 Teaching Assistant, *Information and Signaling in Neurons and Networks*, with Dr. Richard Tsien and Dr. Stephen Baccus, Stanford University  
2008 Teaching Assistant, “Stanford Intensive Neuroscience” graduate program boot camp

### *Conference Presentations*

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- Steinmetz NA**, Zátka-Haas P, Carandini M, Harris KD. Neuronal populations supporting vision, action, and reward across the mouse brain. Poster at Society for Neuroscience 2017, Washington, DC.
- Steinmetz NA**, Carandini M, Harris KD. Distributed neuronal populations supporting vision, action, and reward across the mouse brain. Poster at International Conference for Advanced Neurotechnology 2017, Freiburg, Germany.
- Steinmetz NA**, Pachitariu M, Burgess CP, Rossant C, Harris T, Carandini M, Harris KD. Recording large, distributed neuronal populations with next-generation electrode arrays in behaving mice. Poster at Society for Neuroscience 2016, San Diego, CA.
- Steinmetz NA**, Pachitariu M, Rossant C, Hunter MLD, Neto JP, Kampff A, Carandini M, Harris KD. Neuropixels and Kilosort: 384-channel recordings in awake mice and improved spike-sorting software. Poster at International Conference for Advanced Neurotechnology 2016, Ann Arbor, MI.
- Steinmetz NA**, Burgess CP, Kadir SN, Rossant C, Goodman DFM, Hunter MLD, Carandini M, Harris KD. Neural correlates of visually-guided behavior in mouse cingulate cortex. Poster at Society for Neuroscience 2015, Chicago, IL.
- Steinmetz NA**, Kadir SN, Rossant C, Goodman DFM, Hunter MLD, Carandini M, Harris KD. Next-generation microelectrode arrays for probing the neocortical circuits underlying visually-guided behavior. Poster at Brain Informatics and Health 2015, London, UK. \* Awarded Best Poster.
- Steinmetz NA**, Moore T. Circuits underlying covert attention and saccade preparation within the primate frontal eye field. Poster at FENS Brain Conference on Controlling Neurons, Circuits, and Behavior 2014, Copenhagen, Denmark.
- Steinmetz NA**, Moore T. Circuits underlying covert attention and saccade preparation within the primate frontal eye field. Poster at Society for Neuroscience 2014, Washington, D.C.

- Engel T, **Steinmetz NA**, Moore T, Boahen K. Effects of attention on spatio-temporal correlations across layers of a single column in area V4. Poster at Computational and Systems Neuroscience (Cosyne) Conference 2013, Salt Lake City, UT.
- Steinmetz NA**, Benjamin BV, Boahen K. NMDA-mediated feedback accounts for effects of visual spatial attention in Neurogrid simulations. Poster at Computational and Systems Neuroscience (Cosyne) Conference 2013, Salt Lake City, UT.
- Steinmetz NA**, Moore T. Simultaneous measurement of visual response modulation across cortical layers in area V4 during covert attention and saccade preparation. Poster at Society for Neuroscience 2012, New Orleans, LA.
- Steinmetz NA**, Moore T. Pattern of attentional and presaccadic modulation of visual responses in macaque V4 measured simultaneously across cortical layers. Poster at Computational and Systems Neuroscience (Cosyne) Conference 2012, Salt Lake City, UT.
- Steinmetz NA**, Moore T. Pattern of attentional and presaccadic modulation of visual responses in macaque V4 measured simultaneously across cortical layers. Poster at FENS-IBRO Winter School: Neural Coding in Sensory Systems 2012, Obergurgl, Austria.
- Steinmetz NA**, Moore T. Pattern of presaccadic modulation of visual responses in macaque V4 measured simultaneously across cortical layers. Poster at Society for Neuroscience 2011, Washington, D.C.
- Benjamin B, McQuinn E, Gao P, Choudhary S, **Steinmetz NA**, Moore T, Boahen K. Simulating a Two-Cortical Area Model of Top-Down Attention on Neurogrid. Poster at NIH Pioneer Conference 2011, Washington, D.C.
- Merolla P, Arthur J, Benjamin B, Neil D, Elssaad S, **Steinmetz NA**, Moore T, Boahen K. Simulating Cortical Neuron Populations in Real-Time on the Neurogrid Desktop Supercomputer. Poster at NIH Pioneer Conference 2010, Washington, D.C.
- Steinmetz NA**, Moore T. (2010) Changes in the Response Rate and Response Variability of Area V4 Neurons During the Preparation of Saccadic Eye Movements. Poster at Computational and Systems Neuroscience (Cosyne) Conference 2010, Salt Lake City, UT.
- Steinmetz NA**, Moore T. (2008) A Signature of Eye Movement Preparation in the Response Variability of Area V4 Neurons. Poster at Dynamical Neuroscience XVI, Washington D.C.