Cristopher M. Niell

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Academic positions

2017 –	Associate Professor Department of Biology and Institute of Neuroscience	University of Oregon
2011 – 2017	Assistant Professor Department of Biology and Institute of Neuroscience	University of Oregon

Education

2005 – 2011	Post-doctoral Fellow *Mentor* : Dr. Michael Stryker *Project :* "Visual processing and perception in mouse cortex"	UC San Francisco
1998 –2004	Ph.D., Neuroscience *Advisor* : Dr. Stephen Smith *Thesis* : "Function and development of the zebrafish visual system"	Stanford University
1991 – 1995	Bachelor of Science in Physics, with honors *Advisor* : Dr. Steven Chu *Thesis* : "High-speed confocal measurement of DNA polymer dynamics"	Stanford University

Fellowships and Honors

2021	University of Oregon Faculty Excellence Award
2017	Oregon Medical Research Foundation New Investigator Award
2016	Office of Naval Research Young Investigator Award
2013	University of Oregon RIGE Early Career Award
2012	NIH New Innovator Award recipient
2012	Searle Scholar recipient
2012	Sloan Foundation Research Fellowship
2006	Helen Hay Whitney Foundation Postdoctoral Fellowship
2005	National Research Service Award (NRSA) Postdoctoral Fellowship
1998	Howard Hughes Predoctoral Fellowship
1997	Stanford Graduate Fellowship
1995	Firestone Medal for undergraduate research
1989	Member of US Physics Olympiad team

Publications

1. Parker PRL*, Abe ETT*, Leonard ESP, Martins DM, and **Niell CM** (2022) Joint coding of visual input and eye/head position in V1 of freely moving mice. *bioRxiv*
2. Parker PRL, Abe ETT, Beattie NT, Leonard ESP, Martins DM, Sharp SL, Wyrick DG, Mazzucato L, and **Niell CM** (2021). Distance estimation from monocular cues in an ethological visuomotor task. *bioRxiv.*

3. Grearson AG, Dugan A, Sakmar T, Sivitilli DM, Gire DH, Caldwell RL, **Niell CM**, Dolen G, Wang ZY, Grasse B. (2021) The Lesser Pacific Striped Octopus, *Octopus chierchiae*: an emerging laboratory model. *Frontiers in Marine Science* (8).

4. **Niell CM** and Scanziani M (2021) How cortical circuits implement cortical computations: mouse visual cortex as a model. *Annual Review of Neuroscience*. 44:517-546

5. Michaiel AM, Abe ETT, and **Niell CM**. (2020) Dynamics of gaze control during prey capture in freely moving mice. *eLife. 9:e57458*

6. Parker PRL, Brown MA, Smear MC, and **Niell CM**. (2020) Movement-related signals in sensory areas: roles in natural behavior. *Trends in Neurosciences*. 43(8):581-595 (review)

7. Onorato I, Neuenschwander S, Hoy JL, Lima B, Rocha K, Broggini A, Uran C, Spyropoulos G, Klon-Lipok J, Womelsdorf T, Fries P, **Niell CM**, Singer W, Vinck M. (2020) A distinct class of bursting neurons with strong gamma synchronization and stimulus selectivity in monkey V1. *Neuron* 105(1):180-197

8. Tomorsky J, Parker PRL, Doe CQ, **Niell CM. (**2020) Precise levels of nectin-3 are required for proper synapse formation in postnatal visual cortex. *Neural Development.* 15(1):13.

9. Hoy JL, Bishop HI, and **Niell CM** (2019). Defined cell types in superior colliculus make distinct contributions to prey capture behavior in the mouse. *Current Biology* 29(23):4130-38.

10. Posner MI and **Niell CM.** (2019) Illuminating the neural circuits underlying orienting of visual attention. *Vision*. 3(1), 4. (review)

11. Weible AP, Posner MI, and **Niell CM** (2019). Involvement of three brain regions during mouse skill learning. *eNeuro* 6(4).

12. Michaiel A, Parker PRL, and **Niell CM.** (2019) A hallucinogenic serotonin-2A agonist reduces visual response gain and alters temporal dynamics in mouse visual V1. *Cell Reports* 26(13):3475-3483.

13. Tschetter WW, Govindaiah G, Etherington IM, Guido W, **Niell CM**. (2018). Refinement of spatial receptive fields in the developing mouse LGN is coordinated with excitatory and inhibitory remodeling. *Journal of Neuroscience.* 38(19):4531-42.

14. Song C, Piscopo DM, **Niell CM**, and Knopfel T (2018) Cortical signatures of wakeful somatosensory processing. *Sci Reports.* 8(1):11977.

15. Piscopo DM, Weible AP, Rothbart MK, Posner MI, and **Niell CM**. (2018) Changes in white matter in mice resulting from low frequency brain stimulation. *Proceedings of the National Academy of Sciences.* 115(27):6339-6346.

16. Tomorsky J, DeBlander L, Kentros CG, Doe CQ, **Niell CM**. (2017) TU-tagging: a method for identifying layer-enriched neuronal genes in developing visual cortex. *eNeuro* 0181-17.2017.

17. Kim TH, Zhang Y, Lecoq J, Jung JC, Li J, Zeng H, **Niell CM**, Schnitzer MJ. (2016) Long-term optical access to an estimated one million neurons in the live mouse cortex. *Cell Reports* 17(12):3385-3394.

18. Hoy JL, Yavorka I, Wehr M, and **Niell CM** (2016). Vision drives accurate approach behavior during prey capture in laboratory mice. *Current Biology* 26(22): 3046-3052.

19. Wekselblatt JW, Flister ED, Piscopo DM, and **Niell CM**. (2016) Large-scale imaging of cortical dynamics during sensory perception and behavior. *Journal of Neurophysiology* 115(6):2852:66.

20. **Niell, CM.** (2015) Cell types, circuits, and receptive fields in mouse visual cortex. *Annual Review of Neuroscience*. 38:413-31. (review)

21. Hoy, JL, and **Niell CM**. (2015) Layer-specific refinement of visual cortex function after eye-opening in the awake mouse. *Journal of Neuroscience* 35(8):3370-83.

22. Weible AP, Liu C, **Niell CM**, and Wehr M. (2014) Auditory cortex is required for fear potentiation of gap detection. *Journal of Neuroscience*. 34(46):15437-45.

23. Lee, AM, Hoy, JL, Bonci, A, Wilbrecht, LW, Stryker, MP, and **Niell, CM.** (2014) Identification of a brainstem circuit regulating visual cortical state in parallel with locomotion. *Neuron.* 83(1):455

24. Piscopo DM, El-Danaf R, Huberman AD, and **Niell CM**. (2013) Diverse visual features encoded in mouse lateral geniculate nucleus. *Journal of Neuroscience.* 33(11): 4642-56.

25. **Niell CM**, Bonin V, and Andermann ML. Functional organization of circuits in the rodent primary visual cortex. (2013) In *The New Visual Neurosciences*. Werner JS, Chalupa LM, editors. Cambridge, MA: The MIT Press. p.409-424.

26. Huberman, AD and **Niell CM**. (2011) What can mice tell us about how vision works? *Trends in Neurosciences.* 34(9):464-73. (review)

27. **Niell CM** and Stryker MP. (2010) Modulation of visual responses by behavioral state in the mouse visual cortex. *Neuron*. 65(4):472-9.

28. **Niell CM** and Stryker MP. (2008) Highly selective receptive fields in mouse visual cortex. *Journal of Neuroscience*. 28(30) : 7520-36.

29. Cang J*, **Niell CM*,** Liu X, Pfeiffenberger C, Feldheim DA, Stryker MP. (2008) Selective disruption of one Cartesian axis of cortical maps and receptive fields by deficiency in ephrin-As and structured activity. *Neuron.* 57(4) : 511-23.

30. **Niell CM**. (2006). Theoretical analysis of a synaptotropic growth mechanism. *Journal of Theoretical Biology*. 241(1):39-48.

31. **Niell CM** and Smith SJ. (2005) Functional imaging reveals rapid development of visual response properties in the zebrafish tectum. *Neuron*. 45(6) : 941-51.

32. **Niell CM**, Smith SJ. (2004) Live optical imaging of nervous system development. *Annual Review of Physiology.* 66:771-798. (review)

33. **Niell CM***, Meyer MP*, Smith SJ. (2004) In vivo imaging of synapse formation on a growing dendritic arbor. *Nature Neuroscience*.7(3):254-260.

Current support

R01 NS118461 (Niell, McCormick) NIH/NINDS *Brain States and Flexible Behavior*	06/01/20 – 05/31/25 $620,738/yr	2.0 months
R01 NS118466 (Niell) NIH/NINDS *Neural coding and functional organization of the octopus visual system*	06/01/20 – 05/31/25 $250,000/yr	3.0 months
R01 NS111669 (Smith, Niell) NIH/NINDS *Cortical visual processing for navigation*	04/15/21 – 03/31/26 $694,000/yr	2.0 months
R21 EY032708 (Niell) NIH/NEI *A naturalistic visual task for studying depth estimation in the mouse*	05/01/21 – 04/30/23 $150,000/yr	1.0 months

NSF MRI 2019156 (Niell, Postlethwait)	08/01/20 – 07/31/23	No effort
National Science Foundation	$299,782 total	
Acquisition of a High-Throughput Fluorescence Slide-Scanner Microscope		
RGP0042 (Niell, Hochner)	05/01/19 - 04/30/22	No effort
Human Frontiers Science Program	$250,000/yr	
Imaging sensory processing and memory storage in the octopus brain		

Courses taught (University of Oregon)

Bio 399 – *The Visual System*
Undergraduate course that I developed to provide an inter-disciplinary approach to understand vision from photoreceptors to perception

Bio 410/510 – *Matlab for Biologists*
Undergraduate/graduate course that I developed providing the basics of scientific programming in Matlab, including a hands-on lab component

Bio 601 - *Seminar in Neurophysiology*
Graduate-level seminar and discussion course, based on research in progress

Bio 610 – *Systems Neuroscience*
Team-taught graduate course, lecturer on the visual system

Selected service (past 3 years)

University of Oregon (note: on sabbatical 2018-2019)

2017-2018	UO Research Advisory Board
2019-	Chair, TeACS (animal facility) Faculty Advisory Committee
2019 -	Executive committee member, UO Institute of Neuroscience
2019 -	Mentor, Students of Color Opportunities in Research Enrichment (SCORE)
2019, 2021-	Member and chair (2021), Biology graduate recruitment committee
2020-	Founding co-chair, Institute of Neuroscience Diversity, Equity, Inclusion (DEI) committee

External

2018 -	Program committee, Computational and Systems Neuroscience meeting
2020 -	Co-chair, Computational Neuroethology meeting
2019 -	Associate Editor, Neural Development
Ongoing	Reviewer: Nature, Science, Neuron, Nature Neuroscience, Current Biology, eLife, Journal of Neuroscience, Cell Reports, Journal of Comparative Neurology
Ongoing	Ad hoc member – NIH study sections: Sensory perception and cognition, BRAIN Initiative