

MARIUS PACHITARIU

APPOINTMENTS

2017- Group Leader at HHMI Janelia

Ashburn, VA

POSTDOCTORAL EXPERIENCE

2014-2017 UCL
with Kenneth Harris and Matteo Carandini

London

EDUCATION

2014 Gatsby Unit, UCL
PhD, Computational Neuroscience and Machine Learning

London

2010 Princeton University
BA, Mathematics (full scholarship)

Princeton

PUBLICATIONS

[Google scholar profile](#)

* denotes equal first author contribution

2022 **Pachitariu** and Stringer
[Cellpose 2.0: how to train your own model](#)

bioRxiv

Gardner, Hermansen, **Pachitariu**, Burak, Baas, Dunn, Moser, Moser
[Toroidal topology of population activity in grid cells](#)

Nature

Hart, ..., **Pachitariu**, ..., Wallisch
[Neuromatch Academy: a 3-week, online summer school in computational neuroscience](#)

Journal of Open Source Education

2021 Stringer, Michaelos and **Pachitariu**
[High precision coding in mouse visual cortex](#)

Cell

Steinmetz*, Aydin*, Lebedeva*, Okun*, **Pachitariu***, ..., Harris
[Neuropixels 2.0: A miniaturized high-density probe for stable, long-term brain recordings](#)

Science

Stringer, Wang, Michaelos and **Pachitariu**
[Cellpose: a generalist algorithm for cellular segmentation](#)

Nature Methods

Siegle, ..., **Pachitariu**, ... , Olsen and Koch
[A survey of spiking activity reveals a functional hierarchy of mouse corticothalamic visual areas](#)

Nature

Eiselt, Chen, Chen, Arnold, Kim, **Pachitariu** and Sternson
[Hunger or thirst state uncertainty is resolved by outcome evaluation in medial prefrontal cortex to guide decision-making](#)

Nature Neuroscience

Lee, Ni, Colonell, Karsh, Putzeys, **Pachitariu**, Harris, Meister
[Electrode pooling can boost the yield of extracellular recordings with switchable silicon probes](#)

Nature Communications

Pandey, **Pachitariu**, Brunton, KD Harris
[Structured random receptive fields enable informative sensory encodings](#)

bioRxiv

Van Viegen, ..., **Pachitariu**, ..., Peters

Trends in Cognitive Sciences

- 2020 Schroder, Steinmetz, Krumin, **Pachitariu**, Rizzi, Lagnado, Harris and Carandini *Neuron*
[Retinal outputs depend on behavioural state](#)
- 2019 Stringer and **Pachitariu** *Curr Opin Neurobiol*
[Computational processing of neural recordings from calcium imaging data](#)
- Stringer*, **Pachitariu***, Steinmetz, Reddy, Carandini and Harris *Science*
[Spontaneous behaviors drive multidimensional, brainwide activity](#)
- Stringer*, **Pachitariu***, Steinmetz, Carandini and Harris *Nature*
[High-dimensional geometry of population responses in visual cortex](#)
- Allen, Chen, Pichamoorthy, Tien, **Pachitariu**, Luo and Deisseroth *Science*
[Thirst regulates motivated behavior through modulation of brainwide neural population dynamics](#)
- 2018 Dipoppa, Ranson, Krumin, **Pachitariu**, Carandini and Harris *Neuron*
[Vision and locomotion shape the interactions between neuron types in mouse visual cortex](#)
- Berens, Freeman, ..., **Pachitariu**, ... and Bethge *PLOS CB*
[Community-based benchmarking improves spike rate inference from two-photon calcium imaging data](#)
- Pachitariu**, Stringer and Harris *J Neuroscience*
[Robustness of spike deconvolution for neuronal calcium imaging](#)
- 2017 Jun, Steinmetz, ...**Pachitariu**, ... and Harris T *Nature*
[Fully integrated silicon probes for high-density recording of neural activity](#)
- Pachitariu** and Sahani *bioRxiv*
[Visual motion computation in recurrent neural networks](#)
- 2016 Stringer*, **Pachitariu***, Okun, Bartho, Harris, Sahani and Lesica *eLife*
[Inhibitory control of shared variability in cortical networks](#)
- Pachitariu**, Steinmetz, Kadir, Carandini and Harris *NIPS*
[Fast and accurate spike sorting of high-channel count probes with Kilosort](#)
- Pachitariu**, Stringer, Schroder, Dipoppa, Rossi, Carandini and Harris *bioRxiv*
[Suite2p: beyond 10,000 neurons with standard two-photon microscopy](#)
- 2015 Poort*, Khan*, **Pachitariu**, ..., Sahani, Keller, Mrsic-Flogel and Hofer *Neuron*
[Learning enhances sensory and multiple non-sensory representations in primary visual cortex](#)
- Pachitariu**, Lyamzin, Sahani and Lesica *J Neuroscience*
[State-dependent population coding in primary auditory cortex](#)
- Pachitariu** *PhD thesis, UCL*
[Neural dynamics in cortical populations](#)
- 2013 **Pachitariu**, Petreska and Sahani *NIPS*
[Recurrent linear models of simultaneously-recorded neural populations](#)
- Pachitariu**, Pettit, Dagleish, Packer, Hausser and Sahani *NIPS*
[Extracting regions of interest from biological images with convolutional sparse block coding](#)
- Pachitariu** and Sahani *arXiv*

Regularization and nonlinearities for neural language models: when are they needed?

- 2012 **Pachitariu** and Sahani NIPS
[Learning visual motion in recurrent neural networks](#)
- 2010 **Pachitariu** BA thesis, Princeton
[Spike train statistics](#)

ANALYSIS SOFTWARE

[Cellpose](#) (cellular segmentation)
[Suite2p](#) (calcium imaging)
[Kilosort1](#) and [Kilosort2](#) (spike sorting)
[Rastermap](#) (manifold embedding)
[Ensemble Pursuit](#) (clustering algorithm)
[Facemap](#) (behavioral processing)

TEACHING AT SUMMER SCHOOLS

- 2022 Neuromatch Academy CN & DL (chief group projects officer)
- 2021 Neuromatch Academy CN & DL (chief group projects officer)
- 2020 Neuromatch Academy CN (volunteer)
- 2019 Neural Data Science (organizer) CSHL
Interacting with neural circuits (lecturer) Champalimaud
Learning to use Suite2p and Kilosort2 (organizer) Janelia
- 2018 Neural Imaging Course (lecturer) CSHL
Junior Scientist Workshop on Theoretical Neuroscience (lecturer) Janelia
- 2017 Neural Data Analysis (lecturer) CSHL
Neural Imaging Course (lecturer) CSHL
TENSS (lecturer) Romania
- 2016 TENSS (lecturer) Romania

WORKSHOPS

- 2016 *Junior Scientist Workshop on Neural Circuits and Behavior* Janelia
- 2012 *First deep learning summer school* IPAM UCLA
- 2011 *Probabilistic models of cognition* IPAM UCLA

AWARDS

International Mathematics Olympiad '05, '06 - two bronze medals
Balkan Mathematics Olympiad '02, '04, '05, '06 - one gold, two silver, one bronze
International Mathematics Contest for university students '07, '08 - two second prizes
Romanian National Mathematics Olympiad and IMO Training Team '01-'06