

# Dr. Raphael Vallat

Postdoctoral researcher



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🐙 RaphaelVallat 🐦 RaphaelVallat

## 📄 PROFILE

I am a neuroscientist and sleep researcher in the Center for Human Sleep Science 📍 at UC Berkeley.

My research examines how sleep impacts human behavior and physiology. My work has been featured in several news media and podcasts (e.g. New York Times, Discover Magazine, This Is Your Brain).

I am also passionate about machine learning and algorithm development. I specialize in the analysis of polysomnography and wearable physiological data.

## 🎓 EDUCATION

### PhD in Neuroscience,

Université Claude Bernard Lyon 1 📍

2014 – 2017 | Lyon, France

My doctoral research aimed at understanding the neural correlates of dream recall, using simultaneous electroencephalography (EEG) and functional MRI.

### Master in Neuroscience,

Université Claude Bernard Lyon 1 📍

2012 – 2014 | Lyon, France

### Bachelor in Cognitive Sciences,

Université Lumière Lyon 2 📍

2009 – 2012 | Lyon, France

Ranked 1st.

## 📁 WORK EXPERIENCE

### Postdoctoral researcher,

University of California, Berkeley 📍

2018 – present | Berkeley, USA

My research with Pr. Matthew Walker 📍 focuses on the impact of sleep—or the lack of it—on human behavior and physiology.

Recently, we have shown that the immune system mediates the association between poor sleep and atherosclerosis. In current works, we are examining the impact of sleep on 1) Alzheimer's disease pathology, 2) postprandial metabolism and 3) decision-making.

### Open-source developer

2017 – present

For my research, I have created several open-source packages in Python, which are now being used by thousands across the globe.

- Pingouin 📍: general statistics (>200k downloads)
- YASA 📍: sleep analysis
- Entropy 📍: complexity of EEG time-series

### Teaching assistant 📍

2014 – present

- Neurobiology (undergraduate level)
- Social science (medical school)
- Neuroimaging (graduate level)
- Machine-learning in Python (lab workshop)
- Supervision of undergraduate and master students

## 📄 SELECTED PUBLICATIONS

### Broken sleep predicts hardened blood vessels,

PLoS Biology (2020) 📍

Vallat\*, Shah\*, Redline, Attia and Walker (\*co-first authors)

### Sleep loss and the socio-emotional brain,

TICS (2020) 📍

Ben Simon\*, Vallat\*, Barnes and Walker (\*co-first authors)

### Brain functional connectivity upon awakening from sleep predicts inter-individual differences in dream recall frequency, SLEEP (2020) 📍

Vallat, Nicolas and Ruby

## SKILLS

### Software development

Python, Matlab, R, cloud-computing, Git, Docker

### Signal processing

Polysomnography (EEG, EOG, EMG, EKG), actigraphy, accelerometer, photoplethysmography (PPG), heart rate variability (HRV)

### Data science

Machine-learning, statistical modeling, data processing and visualization

### Academic research

Data collection (EEG, functional MRI, online survey, behavioral tasks), sleep scoring, team management, scientific writing, public speaking

## AWARDS

### Three-year PhD fellowship,

French Ministry of Higher Education and Research  
2014

### Two-year merit scholarship,

French Ministry of Education  
2012

## LANGUAGES

French	● ● ● ● ●
English	● ● ● ● ●
Italian	● ● ● ● ●

**Hard to wake up? The cerebral correlates of sleep inertia assessed using combined behavioral, EEG and fMRI measures**, *NeuroImage* (2019) [↗](#)

Vallat, Meunier, Nicolas, and Ruby

**Visbrain: A multi-purpose GPU-accelerated open-source suite for multimodal brain data visualization**, *Frontiers in Neuroinformatics* (2019) [↗](#)  
Combrisson, Vallat, et al.

**Pingouin: statistics in Python**,  
*Journal of Open Source Software* (2018) [↗](#)  
Vallat

**Dream recall frequency is associated with medial prefrontal cortex white-matter density**,  
*Frontiers in Psychology* (2018) [↗](#)  
Vallat, Eichenlaub, Nicolas, and Ruby

**Characteristics of the memory sources of dreams: a new version of the content-matching paradigm to take mundane and remote memories into account**,  
*PLoS One* (2017) [↗](#)  
Vallat, Chatard, Blagrove, and Ruby

## REFERENCES

**Pr. Matthew Walker**, *Postdoc supervisor*,  
University of California, Berkeley  
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**Dr. Perrine Ruby**, *PhD supervisor*,  
Université Claude Bernard Lyon 1  
perrine.ruby@inserm.fr