

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 — or lack thereof — 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 algorithm development and machine learning. 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 project 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 on human health. Recently, we have shown that the immune system mediates the association between poor sleep and atherosclerosis. In current works, we are 1) developing novel EEG biomarkers of Alzheimer's disease, and 2) examining the causal influence of sleep on next-day metabolism (e.g. glucose regulation).

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
- Antropy [📄](#): complexity of EEG time-series

Teaching [📄](#)

2014 – present

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

📄 SELECTED PUBLICATIONS

Impact of insufficient sleep on dysregulated blood glucose control under standardised meal conditions,

Diabetologia (2021) [📄](#)

Tsereteli, Vallat, *et al.*

An open-source, high-performance tool for automated sleep staging, *eLife* (2021) [📄](#)

Vallat and Walker

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)



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



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

Vallat, Nicolas and Ruby

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
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