

Dr. Annie G. Bryant

✉ annie.bryant@sydney.edu.au
🌐 anniegbyrant.github.io

🐦 @anniegbryant
🔗 bit.ly/AnnieGoogleScholar

🌐 anniegbyrant



Education

- 2022 – 2025 📖 **Doctor of Philosophy, The University of Sydney, Australia.**
🔗 **Dynamics and Neural Systems Group**, School of Physics.
Thesis title: *Quantifying dynamical properties of brain activity using complex systems analysis.*
- 2019 – 2020 📖 **M.Sc. Bioinformatics, Northeastern University, Boston.**
- 2014 – 2019 📖 **B.Sc. Behavioral Neuroscience, Northeastern University, Boston.**
Graduated *Magna cum laude* with University Honors Program Distinction.

Employment History

- 2026 – 🏢 **Postdoctoral Research Associate.** The University of Sydney, Australia.
In my postdoctoral research, I integrate clinical systems neuroscience with methods from complex systems analysis, focusing on brain dynamics in Parkinson's disease.
- 2024 – 2025 🏢 **Data Science Consultant.** Linus Biosciences, North Brunswick, New Jersey. 🔗
Analyzed properties of elemental dynamics in the hair exposome for the early detection of autism spectrum disorder.
- 2019 – 2022 🏢 **Research Technician.** Massachusetts General Hospital/Harvard Medical School.
Studied interactions between tau pathology and vascular dysfunction in the Alzheimer's disease brain through multi-omics and multimodal neuroimaging analysis.
- 2018 🏢 **Research Co-op.** Early Discovery Neuroscience, Merck Research Laboratories, Boston.
Characterized glial responses in a mouse model of Parkinson's disease using intra-striatal injections of alpha synuclein pre-formed fibrils.
- 2017 – 2018 🏢 **Research Co-op.** Massachusetts General Hospital/Harvard Medical School.
Investigated the effects of pharmacological depletion of microglia on the progression of tau pathology in the rTg4510 tau-overexpressing mouse model of Alzheimer's disease.

Scholarships, Grants, and Awards

- 2026 🏆 NSW Nominee for the Bragg Gold Medal for Excellence in Physics.
Australian Institute of Physics.
- 🏆 School of Physics Research Award for the Best PhD Thesis, **A\$1000.**
The University of Sydney.
- 🏆 Maths in the Brain Speaker Travel Grant, **A\$500.** *Monash University.*
- 2025 🏆 Paulette Isabel Jones Career Award, **A\$8000.** *The University of Sydney.* 🔗
- 🏆 NHMRC Ideas Grant: *Brain signature of loss-of-consciousness across species* (2025-2029). CIs: N. Tsuchiya, B. D. Fulcher, D. Shimaoka, N. Price, **A. G. Bryant.**
Total awarded: A\$1 111 302.20.
- 🏆 People's Choice Winner, Sydney Clinical Imaging Network Summit 2025.
The University of Sydney.
- 2023 – 2024 🏆 Postgraduate Research Support Scheme. *The University of Sydney.*
- 2022 – 2025 🏆 Postgraduate Scholarship in Nanoscale Brain Navigation with DNA Computing, **A\$1,000p.a.** *The University of Sydney.*

Scholarships, Grants, and Awards (continued)

- 2023 – 2025  Australian Research Training Program International Stipend, **A\$40,109p.a.** (2024 rate). *The Australian Commonwealth Department of Education and Training.* 
-  Australian Research Training Program Tuition Scholarship, **A\$53,500p.a.** (2024 rate). *The Australian Commonwealth Department of Education and Training.* 
- 2024  1st Prize, HDR Rapid Fire Presentation at the 2024 Computational and Advanced Neuroimaging Symposium and Workshop, **A\$100.** *The University of Sydney.*
-  1st Prize, BIOMAG Connectivity Data Challenge, **€1000.** *COGITATE Consortium.* 
-  Early Career Researcher Best Poster Award, **A\$150.** *2024 OHBM Australian Chapter Conference.*
-  1st Prize for Oral Presentation, School of Physics Symposium 2024, **A\$200.** *The University of Sydney.*
- 2022  Graduate Education Fund Scholarship, **\$40,000.** *The American Australian Association.* 

Teaching and Supervision

- 2026 –  Guest lecturer for BMSC5002 ('Advances in Disease Diagnosis and Treatment') at The University of Sydney: 'MRI in Disease Diagnosis'.
-  Guest lecturer and tutorial leader for NEUR3006 ('Applied Neuroscience') at The University of Sydney: 'Functional neuroimaging'.
- 2024 – 2025  Guest lecturer for BMRI5012 ('Brain Ageing') at The University of Sydney: 'Brain Imaging Across Neurodegenerative Diseases'.
- 2024  Guest lecturer for CSYS5040 ('Criticality in Dynamical Systems') at The University of Sydney: 'Highly comparative time-series analysis for nonlinear systems'.  [Slides.](#)
- 2022 – 2024  Teaching assistant for Interdisciplinary Physics (PHYS3888), The University of Sydney.
-  Teaching assistant for Sydney Science 2050: Towards the Future (SCIE1001), The University of Sydney.
- 2023  Supervisor for a Special Studies Program Physics Undergraduate Project, 'Studying how brain region dynamics shape network communication through time-series analysis', with students Taj Astill and Oliver Sacks at The University of Sydney.

Research Publications

Peer-Reviewed Publications

- 2026 **Bryant, A. G.** Subcortex visualization: a toolbox for custom data visualization in the subcortex and cerebellum. *Aperture neuro* **6.**  doi:<https://doi.org/10.52294/001c.165884>.
- Bryant, A. G.,** Cliff, O. M., Shine, J. M., Fulcher, B. D. & Lizier, J. T. Unifying concepts in information-theoretic time-series analysis. *Journal of the royal society interface.*  doi:[10.1098/rsif.2025.0969](https://doi.org/10.1098/rsif.2025.0969).
- Bryant, A. G.***, Jha, A.*, Agarwal, S., Cahill, P., Lam, B., Oldham, S., Arnatkevičiūtė, A., Fornito, A. & Fulcher, B. Benchmarking overlapping community detection methods for applications in human connectomics. *Network neuroscience.* *Co-first authors., 1–58.  doi:[10.1162/netn.a.39](https://doi.org/10.1162/netn.a.39).
- Bryant, A. G.** & Whyte, C. J. A data-driven approach to identifying and evaluating connectivity-based neural correlates of consciousness. *Neuroscience of consciousness* **2026.**  doi:[10.1093/nc/niag029](https://doi.org/10.1093/nc/niag029).

- Goossens, F. M., Ehgoetz Martens, K. A., Bloem, B. R., Helmich, R. C., Howe, E. E., Kessels, R. P. C., Roerdink, M., **Bryant, A. G.**, Shine, J. M., Tosserams, A., Lewis, S. J. G. & Nonnekes, J. Pharmacologically modulating the noradrenergic arousal system to reduce freezing of gait in Parkinson's Disease: Study protocol of the international AnTi-FREEZE study. *European journal of neuroscience* **64**, e70630. [doi:https://doi.org/10.1111/ejn.70630](https://doi.org/10.1111/ejn.70630).
- 2025 **Bryant, A. G.***, Malla, S.*, Jayakumar, R., Woost, B., Wolf, N., Li, A., Das, S., Van Veluw, S. J. & Bennett, R. E. Molecular profiling of frontal and occipital subcortical white matter hyperintensities in Alzheimer's disease. *Frontiers in neurology* **15**. *Co-first authors. [doi:10.3389/fneur.2024.1470441](https://doi.org/10.3389/fneur.2024.1470441).
- Tan, J. B., Orlando, I. F., Whyte, C., **Bryant, A. G.**, Munn, B. R., Baracchini, G., King, M., O'Callaghan, C., Müller, E. J. & Shine, J. M. Cerebellar and subcortical contributions to working memory manipulation. *Communications biology* **8**, 1028. [doi:10.1038/s42003-025-08467-0](https://doi.org/10.1038/s42003-025-08467-0).
- 2024 **Bryant, A. G.**, Aquino, K., Parkes, L., Fornito, A. & Fulcher, B. D. Extracting interpretable signatures of whole-brain dynamics through systematic comparison. *PLoS computational biology* **20**, e1012692. [doi:10.1371/journal.pcbi.1012692](https://doi.org/10.1371/journal.pcbi.1012692).
- Serrano-Pozo, A., Li, H., Li, Z., Muñoz-Castro, C., Jaisa-aad, M., Healey, M. A., Welikovitch, L. A., Jayakumar, R., **Bryant, A. G.**, Noori, A., *et al.* Astrocyte transcriptomic changes along the spatiotemporal progression of Alzheimer's disease. *Nature neuroscience*, 1–17. [doi:10.1038/s41593-024-01791-4](https://doi.org/10.1038/s41593-024-01791-4).
- 2023 **Bryant, A.**, Li, Z., Jayakumar, R., Serrano-Pozo, A., Woost, B., Hu, M., Woodbury, M. E., Wachter, A., Lin, G., Kwon, T., Talanian, R. V., Biber, K., Karran, E. H., Hyman, B. T., Das, S. & Bennett, R. Endothelial cells are heterogeneous in different brain regions and are dramatically altered in Alzheimer's disease. *Journal of neuroscience*. [doi:10.1523/JNEUROSCI.0237-23.2023](https://doi.org/10.1523/JNEUROSCI.0237-23.2023).
- Cliff, O. M., **Bryant, A. G.**, Lizier, J. T., Tsuchiya, N. & Fulcher, B. D. Unifying pairwise interactions in complex dynamics. *Nature computational science*, 1–11. [doi:10.1038/s43588-023-00519-x](https://doi.org/10.1038/s43588-023-00519-x).
- Lee, H., Fu, J. F., Gaudet, K., **Bryant, A.**, Price, J., Bennett, R., Johnson, K., Hyman, B., Hedden, T., Salat, D., Yen, Y.-F. & Huang, S. Aberrant vascular architecture in the hippocampus correlates with tau burden in mild cognitive impairment and Alzheimer's disease. *Journal of cerebral blood flow and metabolism*. [doi:10.1177/0271678X231216144](https://doi.org/10.1177/0271678X231216144).
- 2021 **Bryant, A. G.**, Manhard, M. K., Salat, D. H., Rosen, B. R., Hyman, B. T., Johnson, K. A., Huang, S., Bennett, R. E. & Yen, Y.-F. Heterogeneity of tau deposition and microvascular involvement in MCI and AD. *Current Alzheimer research* **18**, 711. [doi:10.2174/1567205018666211126113904](https://doi.org/10.2174/1567205018666211126113904).
- Chen, X., Lim-Fat, M. J., Qin, L., Li, A., **Bryant, A.**, Bay, C. P., Gao, L., Miskin, N., Liu, Z., Iorgulescu, J. B., *et al.* A comparative retrospective study of immunotherapy RANO versus standard RANO criteria in glioblastoma patients receiving immune checkpoint inhibitor therapy. *Frontiers in oncology* **11**, 679331. [doi:10.3389/fonc.2021.679331](https://doi.org/10.3389/fonc.2021.679331).
- 2020 **Bryant, A. G.**, Hu, M., Carlyle, B. C., Arnold, S. E., Frosch, M. P., Das, S., Hyman, B. T. & Bennett, R. E. Cerebrovascular senescence is associated with tau pathology in Alzheimer's disease. *Frontiers in neurology* **11**, 575953. [doi:10.3389/fneur.2020.575953](https://doi.org/10.3389/fneur.2020.575953).
- 2018 Bennett, R. E., **Bryant, A.**, Hu, M., Robbins, A. B., Hopp, S. C. & Hyman, B. T. Partial reduction of microglia does not affect tau pathology in aged mice. *Journal of neuroinflammation* **15**, 1–11. [doi:10.1186/s12974-018-1348-5](https://doi.org/10.1186/s12974-018-1348-5).
- Qin, L., Li, A., Qu, J., Reinshagen, K., Li, X., Cheng, S.-C., **Bryant, A.** & Young, G. S. Normalization of ADC does not improve correlation with overall survival in patients with high-grade glioma (HGG). *Journal of neuro-oncology* **137**, 313–319. [doi:10.1007/s11060-017-2719-y](https://doi.org/10.1007/s11060-017-2719-y).

Manuscripts in Submission

- 2025 **Bryant, A. G.**, Shine, J. M. & Fulcher, B. D. Mapping functional, structural, and transcriptomic correlates of homotopic connectivity. [bioRxiv preprint](#), doi:10.1101/2025.06.10.657943.
- 2023 Henderson, T., **Bryant, A. G.** & Fulcher, B. D. Never a dull moment: Distributional properties as a baseline for time-series classification. [arXiv preprint](#), doi:10.48550/arXiv.2303.17809. PAKDD.

Invited Talks and Presentations

- July 2026 📅 'Multiscale Social Dynamics in Individuals and Groups' (MDIG2026) Summer School, MindLabs, Tilburg, The Netherlands. [🔗 Event information](#).
- March 2026 📅 Maths in the Brain 2026 Workshop, Melbourne, Australia. *'Interpretable applications of complex-systems methods for quantitative neuroimaging analysis.'*
- February 2026 📅 Noosa Brain Workshop 2026, Noosa, Australia. *'Only multimodal analysis in the building: Comparative methods for brain structural and functional cartography.'*
- November 2024 📅 Computational and Advanced Neuroimaging Symposium and Workshop, The University of Sydney, Australia. *'The highly comparative approach: Interpretable insights for structural and functional neuroimaging.'*
*Awarded 1st **Prize, HDR Rapid Fire Presentation**.
- February 2024 📅 AI in Healthcare Meetup, Healius, Sydney, Australia. *'Combining time-series analysis with machine learning for interpretable neuroimaging insights.'*
- June 2023 📅 2nd Fudan-Cambridge-Sydney Young Scholar Symposium, Online. *'Multimodal analysis of neural dynamics across neurological disorders.'*
[▶ Presentation recording](#).

Conferences and Symposia

Oral presentations

- June 2026 📅 Organization for Human Brain Mapping 2026 Conference, Bordeaux, France. *'Benchmarking overlapping community detection methods for applications in human connectomics.'*
- July 2025 📅 28th Annual Meeting of the Association for the Scientific Study of Consciousness, Heraklion, Crete, Greece. *'Data-driven MEG analysis identifies candidate metrics for connectivity-based neural correlates of visual experience.'*
- June 2025 📅 Organization for Human Brain Mapping 2025 Conference, Brisbane, Australia. *'Mapping directed information flow between homotopic regions of the human brain.'* [▶ Presentation recording](#).
- March 2025 📅 Sydney Clinical Imaging Network 2025 Summit, The University of Sydney, Australia. *'The highly comparative approach: Interpretable insights for structural and functional neuroimaging.'* [📄 Slides](#). *Selected as the **People's Choice Winner**.
- November 2024 📅 Faculty of Medicine and Health EMCR Symposium, The University of Sydney, Australia. *'Extracting interpretable signatures of whole-brain dynamics through systematic comparison.'* [📄 Slides](#).
- August 2024 📅 BIOMAG 2024 Conference, Sydney, Australia. *'Highly comparative analysis of inter-areal coupling from MEG data to quantify neural correlates of visual experience.'*
- June 2024 📅 Organization for Human Brain Mapping 2024 Conference, Seoul, South Korea. *'Systematically comparing properties of local dynamics and pairwise coupling in the brain.'*
[📄 Slides](#). [▶ Presentation recording](#).

Conferences and Symposia (continued)

-  School of Physics HDR Research Symposium, The University of Sydney, Australia. Systematically comparing properties of local dynamics and pairwise coupling in the brain.  [Slides](#). *Received the **First Prize for Oral Presentation**.
- October 2023  Maths in the Brain 2023, Monash University, Australia. *'Integrating local dynamics and pairwise coupling from functional neuroimaging time series across neuropsychiatric disorders.'*  [Slides](#).
- January 2023  Criticality, Complexity, and Computation (C-3) Symposium 2023, Heron Island, Australia. *'A time-series approach to understanding the brain as a complex system.'*  [Slides](#).
- July 2022  Organization for Computational Neuroscience 2022, Melbourne, Australia. Tutorial session: *'pyspi: python toolkit for statistical analysis of pairwise interactions.'* Workshop session: *'Integrating local and pairwise neural time-series dynamics to classify schizophrenia.'*  [Tutorial repository](#)  [Workshop slides](#)

Selected poster presentations

- June 2026  Organization for Human Brain Mapping 2026 Conference, Bordeaux, France. *'Under the (cortical) mantle: Customized brain visualizations for subcortex and cerebellum in Python.'*
- June 2025  Organization for Human Brain Mapping 2025 Conference, Brisbane, Australia. *'Mapping directed information flow between homotopic regions of the human brain.'*
- November 2024  Organization for Human Brain Mapping 2024 Australian Chapter Conference, Melbourne, Australia. *'Linking structural neuroimaging with transcriptomic profiling of white matter hyperintensities and microvasculature in Alzheimer's disease.'*  [Poster](#). *Received the **Early Career Researcher Best Poster Award**.
- May 2023  The Australian Dementia Research Forum 2023, Surfers Paradise, Australia. *'Leveraging highly-comparative time-series analysis to study properties of neural activity related to amyloid-beta plaque burden.'*  [Poster](#).

Community outreach and engagement

- 2026  Systems Neuroscience and Complexity Planning Committee, The University of Sydney.
- 2026 – 2027  Early career researcher representative on Executive Council for the Australian chapter of the Organization for Human Brain Mapping.
- 2023 –  Peer reviewer for *Molecular Neurobiology*, *Brain Communications*, *Network Neuroscience*, *Neural Computation*, *Behavioral and Brain Functions*, and *The Journal of Prevention of Alzheimer's Disease*.
- 2024 –  STEMpals mentor. 
- 2022 – 2024  Science Extension Program Mentor , The University of Sydney.

Open-source code collaborations

- 2025 –  subcortex-visualization: A toolkit for visualizing data across subcortical atlases. 
Lead developer: Annie G. Bryant
- 2022 –  pyspi: Python Toolkit of Statistics for Pairwise Interactions. 
Lead developer: Oliver M. Cliff, PhD
Contribute to feature enhancement, bug testing, documentation, and tutorials through ongoing repository maintenance.