James Bradley Aimone, Ph.D.

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EDUCATION

University of California, San Diego – La Jolla, California
Doctorate of Philosophy in Neurosciences *09/2005 – 06/2009*
Specialization in Computational Neuroscience
Thesis title: "Computational modeling of adult neurogenesis in the dentate gyrus"
Thesis Committee Chair: Fred H Gage, PhD
Thesis Committee Co-chair: Jeffrey L Elman, PhD

Rice University – Houston, Texas
Masters of Chemical Engineering *09/2001 – 01/2002*
Bachelor of Science in Chemical Engineering *09/1997 – 05/2001*

PROFESSIONAL

Sandia National Laboratories – Albuquerque, New Mexico
Cognitive and Emerging Computing Department; Center for Computing Research
Distinguished Member of Technical Staff, *R&D Computer Science* *06/2022 – Present*
Lead researcher for neural computing group (~10 permanent PhD staff, plus postdoctoral researchers and interns)

Principal Member of Technical Staff, *R&D Computer Science* *01/2015 - 06/2022*

Senior Member of Technical Staff, *R&D Cognitive Systems* *10/2011– 01/2015*

** As a research laboratory, Sandia does not use academic titles, rather a professional track of Member of Technical Staff, Senior Member of Technical Staff, Principal Member of Technical Staff, and Distinguished Member of Technical Staff*

The Salk Institute for Biological Studies – La Jolla, California
Laboratory of Genetics with Dr. Fred H. Gage
Postdoctoral Fellow *06/2009 – 09/2011*
Computational Neuroscience PhD Student *09/2005 – 06/2009*
Research Assistant *for Quantitative Biological Analysis* *02/2002 – 09/2005*

RESEARCH HIGHLIGHTS

- Misha Mahowald Prize for Neuromorphic Engineering (2023)
- Sandia Employee Recognition Award – Individual Leadership (2024)
- National Institutes of Health Wednesday Afternoon Lecture Series Seminar Invitee (2024)
- National Academy of Engineering US Frontiers of Engineering Invitee (2017); Germany-America Frontiers of Engineering Session Organizer (2023)
- Over 100 peer reviewed research papers published in fields ranging from neuromorphic computing, neuroscience, electrical engineering, machine learning, molecular biology, and computer science
- Over 12500 research citations, h-index = 39 (per Google Scholar, May 2026)
https://scholar.google.com/citations?user=fIhoSlAAAAAJ&hl=en

- Invited commentary articles in *Science*, *Nature*, *Nature Communications, Nature Computational Science,* and *Nature Electronics*

- Eleven patents awarded on adaptive neural algorithms and architectures, multiple patent applications under consideration in neural algorithms and neural computing hardware

- Principal Investigator of multi-institution Office of Science Microelectronics **COINFLIPS** (*CO-design Improved Neural Foundations Leveraging Inherent Physics Stochasticity*) project (FY22-24; $6M total)

- Principal Investigator of CRCNS (DOE / NSF / NIH) projects "Extracting Neural Computations from Exascale Simulations" (FY21-23; $1.5M total) and "Decomposing non-linear neural population dynamics to integrate natural behavior, physiology, and neuromorphic hardware" (FY25-27; $900K total)

- Principal Investigator or Deputy Principal Investigator for eight (>$16M total) competitive internal (Laboratory Directed Research & Development) projects

- Invited grant panel reviewer for DOE Office of Science and U.S. National Science Foundation

- Co-founder and organizer of Neuro-Inspired Computing Elements Conference

FELLOWSHIPS, PROFESSIONAL AFFILIATIONS, MENTORSHIP AND HONORS

Sandia National Laboratories Employee Recognition Award
Individual Leadership for COINFLIPS Project *2024*

NIH Wednesday Afternoon Lecture Series Invited Speaker *2024*

Misha Mahowald Prize for Neuromorphic Engineering
PI of team for "Neuromorphic Advantage of Discrete-Time Markov Chain Random Walks" *2023*

National Academy of Engineering Frontiers of Engineering Attendee *2017*
National Academy of Engineering GA-FOE Organizer *2023*

Sandia National Laboratories Computing Research Center Exceptional Service Award *2014*
Sandia National Laboratories Award for Excellence *2013*
Sandia National Laboratories Up & Coming Innovator *2013*

Best Paper Award for
International Conference on Rebooting Computing *2023*

Organizing Committee and Program Chair for
Neuro-Inspired Computational Elements (NICE) Workshop / Conference *2013-2025*

Program and Steering Committee for
International Conference on Neuromorphic Systems (ICONS) *2018-2025*

Scientific Planning Committee for
The BRAIN Initiative NeuroAI Workshop *2024*

Senior Member, IEEE
IEEE Electron Device Society Neuromorphic Technical Committee
Member, Society for Neuroscience
Member, ACM
NSF Temporal Dynamics of Learning Center *2006-2011*
Christopher Reeve Paralysis Foundation *2002-2005*

Kavli Institute for Brain and Mind Research Fellow *2005-2009*
Neuroplasticity of Aging Training Grant Predoctoral Fellow *2006-2007*
Bert and Ethel Aginsky Research Scholar Award *2008-2009*

Editorial Board for IOP Neuromorphic Computing and Engineering

Associate Editor for Frontiers in Systems Neuroscience special issue, Frontiers in Neuroinformatics special issue

Grant Reviewer for *Sandia National Laboratories LDRD program; Los Alamos National Laboratory LDRD program; Department of Energy Office of Science; National Science Foundation; Air Force Office of Scientific Research; Netherlands Organisation for Scientific Research Vidi Program; Alzheimer's Research UK; Chile Ministry of Science, Technology, Knowledge and Innovation*

Postdoctoral Trainees
- Dr. William Severa (currently Associate Professor at University of Texas San Antonio)
- Dr. J. Darby Smith (currently full-time Sandia National Laboratory staff)
- Dr. Kristofer Carlson (currently Senior Scientist at BrainChip, Inc.)
- Dr. Felix Wang (currently full-time Sandia National Laboratory staff)
- Dr. Brad Theilman (currently full-time Sandia national Laboratory Staff)

Thesis Committee for Nicholas Soures, University of Rochester; Lina Tran, University of Toronto; Guangzhi Tang, Rutgers University

COMPETITIVE FUNDING AWARDS

SUMMARY: APPROXIMATELY $30 MILLION IN COMPETITIVE FUNDING AWARDED AS PI OR CO-PI THROUGH DOE OFFICE OF SCIENCE AND SANDIA NATIONAL LABORATORIES LDRD FUNDING PORTFOLIOS. SANDIA IS INELIGIBLE FOR NSF FUNDING.

DEPARTMENT OF ENERGY OFFICE OF SCIENCE (~$9M TOTAL; PI OR CO-PI ONLY SHOWN)

1. 2021-2023 - Extracting Neural Computations from Exascale Simulations (Collaborative Research in Computational Neuroscience; ASCR (NSF/NIH); $1.5M total) *Principal Investigator*

2. 2022-2024 – COINFLIPS: Co-designed Improved Neural Foundations Leveraging Inherent Physics Stochasticity (Co-design in Microelectronics Program; BES/ASCR; $6M total) *Principal Investigator*

3. 2025-2027 – Decomposing Non-Linear Neural Population Dynamics to Integrate Natural Behavior, Physiology, and Neuromorphic Hardware (Collaborative Research in Computational Neuroscience; ASCR (NSF/NIH); $900K total) *Principal Investigator*

4. 2025-2028 – AI-GREEC: Artificial Intelligence and Knowledge Graphs to Accelerate Energy-Efficient Computing (Competitive Portfolios for Advanced Scientific Computing Research / Oak Ridge National Laboratory Award; ASCR; $800K total (to Sandia)) *co-Principal Investigator (Sandia Lead)*

SANDIA LABORATORY DIRECTED RESEARCH AND DEVELOPMENT (~$20M TOTAL; PI OR CO-PI ONLY SHOWN)

1. 2012-2014 – Using High Performance Computing to Examine the Processes of Neurogenesis Underlying Pattern Separation/Completion of Episodic Information (Cognitive Science and Technology; 158836) *Principal Investigator*

2. 2015-2017 – Hardware Acceleration of Adaptive Neural Algorithms for Dynamic and Intelligent Threat Detection (Grand Challenge; 180885) *Deputy Principal Investigator*

3. 2018 – Neural Algorithms for Low Power Implementation of Partial Differential Equations (Computing and Information Sciences; 209192) *Principal Investigator*

4. 2019 – BrainSLAM – Robust Autonomous Navigation in Sensor-Deprived Contexts (National Security Programs; 214488) *Principal Investigator*

5. 2019-2020 – Energy-Efficient Implementation of Partial Differential Equations by Stochastic and Deterministic Neuromorphic Algorithms (Computing and Information Sciences; 212967) *Principal Investigator*

6. 2020 – A Flexible, Highly Scalable, Configurable Neuromorphic Architecture (Advanced Science and Technology; 218241) *Principal Investigator*

7. 2021 – Mapping Stochastic Devices to Probabilistic Algorithms (Advanced Science and Technology; 224121) *Principal Investigator*

8. 2022 – ARNIE: Autonomous Reconfigurable Neural Intelligence at the Edge (National Security Programs; 226004) *Principal Investigator*

   * Note: Sandia LDRD funding levels are proprietary; specific details are available upon request. LDRDs are two-round competitive proposals with roughly 10-20% funding success rate.

PATENTS

1. Awarded January 14, 2014 - Gage, Fred H., **Aimone, James Bradley**, and Wiles Janet – "Temporally dynamic artificial neural networks"; United States Patent #8630966

2. Awarded May 28, 2019 – Naegle, John H.; **Aimone, James Bradley**; Chance, Frances S.; Vineyard, Craig M; Follett, David R; and Follett, Pamela L; - "Temporal Data System"; United States Patent #10303697

3. Awarded October 15, 2019 - Parekh, Ojas; Phillips Cynthia, and **Aimone, James Bradley** - "Constant Depth, Near Constant Depth, and Subcubic Size Threshold Circuits for Linear Algebraic Calculations"; United States Patent #10445065

4. Awarded May 12, 2020 – Quach, Tu-Thach; Agarwal, Sapan; **Aimone, James Bradley**; James, Conrad D. – "Memory Access System"; United States Patent #10649663

5. Awarded January 12, 2021 – Draelos, Timothy J. and **Aimone, James Bradley** – "Adaptive Neural Network Management System"; United States Patent #10891540

6. Awarded April 6, 2021 - **Aimone, James Bradley**; Naegle John H.; Donaldson, Jonathon W.; Follett, David; and Follett, Pamela – "Neuromorphic Computing Architecture with Dynamically Accessible Contexts"; United States Patent #10970630

7. Awarded June 1, 2021 – Wheeler, Jason W.; Quach, Tu-Thach; James, Conrad D.; **Aimone, James Bradley**; and Rodrigues, Arun F. – "Malicious Activity Detection in Memory" United States Patent #11023579

8. Awarded March 22, 2022 - **Aimone, James Bradley**; Lehoucq, Richard B.; Parekh Ojas D.; and Severa, William Mark – "Devices and Methods for Increasing the Speed and Efficiency at which a Computer is Capable of Modeling a Plurality of Random Walkers Using a Particle Method" Patent #11281964

9. Awarded August 9, 2022 – **Aimone, James Bradley**; Lehoucq, Richard B.; Parekh Ojas D.; and Severa, William Mark – "Devices and Methods for Increasing the Speed and Efficiency at which a Computer is Capable of Modeling a Plurality of Random Walkers Using a Density Method" Patent #11409922

10. Awarded September 6, 2022 – Verzi, Stephen Joseph; Vineyard, Craig M.; and Aimone, James Bradley – "Anomaly Detection with Spiking Neural Networks" Patent #11436475

11. Awarded September 12, 2023 – Vineyard, Craig M.; Severa, William Mark; Verzi Stephen J; and **Aimone, James Bradley**– "Devices and Methods for Increasing the Speed or Power Efficiency of a Computer When Performing Machine Learning using Spiking Neural Networks" Patent #11755891
12. Awarded – **Aimone, James Bradley**; Hamlet, Jason; and Quach, Tu-Thach – "Secure Authentication using Recurrent Neural Networks"

13. Filed – Verzi, Stephen J.; Miner, Nadine E.; Vineyard, Craig M.; and **Aimone, James Bradley** - "Optimization Computation with Spiking Neurons"

14. Filed – Severa, William Mark; Parekh, Ojas D.; and **Aimone, James Bradley** – "Spiking Network Algorithms for Scientific Computing"

15. Filed – **Aimone, James Bradley** – "Neural Mosaic Logic Unit"

16. Filed – **Aimone, James Bradley**; Severa, William Mark; and Smith, John Darby – "Device and Method for Random Walk Simulation"

17. Filed – Verzi, Stephen J; Vineyard Craig M; Aimone James Bradley – "Sequence-based Anomaly Detection with Hierarchical Spiking Neural Networks"

18. Filed – Aimone, James Bradley and Wang Felix, "Grid-based Coding of Terrain Maps for Localization"

19. Filed – Aimone, James Bradley and Smith John Darby – "scANNs – Sampling Coinflips Artificial Neural Networks"

20. Filed – Aimone, James Bradley, Misra, Shashank, and Smith, Darby "Sampling of Random Numbers from Arbitrary Distributions"

21. Filed – Aimone, James Bradley and Theilman, Bradley "Neural Circuits for Learning Solutions for Discrete Optimization"

22. Filed – Aimone, James Bradley and Theilman, Bradley "Method for Identifying Recurrent Causal Sequences"

23. Filed – Aimone, James Bradley and Theilman, Bradley "Spiking Neuromorphic Circuits for Solving Finite Element Problems"

24. Filed – Aimone, James Bradley, Teeter, Corinne Michelle, and Vineyard, Craig Michael "Threshold Modulation for Efficient Context Implementations"

PUBLICATIONS

PEER REVIEWED JOURNAL AND CONFERENCE ARTICLES (101 TOTAL, 21 FIRST, 38 LAST, 8 ALPHABETICAL)

1. Theilman BH and **Aimone JB** – "Intrinsic Numerical Robustness and Fault Tolerance in a Neuromorphic Algorithm for Scientific Computing" – *2026 Neuro-Inspired Computational Elements Conference* March 2026

2. Theilman BH and **Aimone JB** – "Solving Sparse Finite Element Problems on Neuromorphic Hardware" –*Nature Machine Intelligence* November 2025

3. Smith JD, Severa W, and Aimone JB – "Synaptic Sampling Networks with True Random Number Generation." – *2025 International Conference on Neuromorphic Systems* July 2025

4. Gautam A, Patton R, Potok T, Kannan R, **Aimone J** and Severa W, 2025, June. AI-Powered Knowledge Graphs for Neuromorphic and Energy-Efficient Computing. In *Proceedings of the Great Lakes Symposium on VLSI* 2025

5. Taylor B, Smith JD, Misra S, **Aimone JB**, and Allemang CR – "Integration of multiple coinflip devices for high-quality random sampling" *Scientific Reports;* 15(1) 2025

6. Patel KP, Maicke A, Arzate J, Kwon J, Smith JD, **Aimone JB**, Incorvia JAC, Cardwell SG, and Schuman CD "AI-guided framework for the design of materials and devices for magnetic-tunnel-junction-based true random number generators" *Communications Engineering* March 2025

7. Kudithipudi D, Schuman C, Vineyard CM, Pandit T, Merkel C, Kubendran R, **Aimone JB,** Orchard G, Mayr C, Benosman R, Hays J, Young C, Barolozzi C, Majumdar A, Cardwell SG, Payvand M, Buckley S, Kulkarni S, Gonzalez HA, Cauwenberghs G, Thakur CS, Subramoney A, and Furber S "Neuromorphic Computing at Scale" *Nature* January 2025

8. Cardwell SG, Smith JD, Patel K, Maicke A, Arzate J, Liu S, Kwon J, Allemang CR, Crowder DC, Misra S, Chance FS, Schuman CD, Incorvia JAC, and **Aimone JB** – "AI-Guided Codesign for Novel Computing Platforms" *Proceedings of the 30th Asia and South Pacific Design Automation Conference* January 2025

9. Mulet I, Theilman B, Patel KP, Arzate J, Maicke A, Smith JD, Aimone JB, Cardwell SG, Incorvia JAC, and Schuman CD "Optimization of Magnetic Tunneling Junction Devices for Neuromorphic Circuits for Solving MAXCUT" *International Conference on Rebooting Computing* December 2024

10. Wolpert D, Korbel J, Lynn C, Tasnim F, Grochow J, Kardes G, **Aimone J**, Balasubramanian V, de Giuli E, Doty D, Freitas N. "Is stochastic thermodynamics the key to understanding the energy costs of computation?". *Proceedings of the National Academies of Sciences.* September 2024

11. Vineyard CM, Severa WM, and **Aimone JB** – "Strategic Considerations for Neuromorphic Computing" *2024 International Conference on Neuromorphic Systems (ICONS)* July 2024

12. Theilman BH, Zhang Q, Kahana A, Cyr EC, Trask N, **Aimone JB**, and Karniadakis GE – "Spiking Physics Informed Neural Networks on Loihi 2" *2024 Neuro-Inspired Computational Elements Conference* April 2024.

13. Kulkarni SR, Tabassum A, Lim SH, Schuman CD, Theilman BH, Rothganger F, Wang F, **Aimone JB** – "Explaining Neural Spike Activity for Simulated Bio-plausible Network through Deep Sequence Learning" *2024 Neuro-Inspired Computational Elements Conference* April 2024.

14. Maicke A, Arzate J, Lieu S, Kwon J, Smith JD, **Aimone JB**, Misra S, Schuman CD, Cardwell SG, and Incorvia JA – "Magnetic Tunnel Junction Random Number Generators Applied to Dynamically Tuned Probability Trees Driven by Spin Orbit Torque" *IOP Nanotechnology;* 35(27) 2024

15. Wang F, Kulkarni S, Theilman B, Rothganger F, Schuman C, Lim SH, and **Aimone JB** – "Scaling neural simulations in STACS" *IOP Neuromorphic Computing and Engineering;* 4(2), April 2024

16. **Aimone JB**, Severa W, Smith JD – "Synaptic Sampling of Neural Networks" *International Conference on Rebooting Computing* December 2023 **Best Paper Award**

17. Kudithipudi D, Daram A, Zyarah AM, Zohora FT, **Aimone JB**, Yanguas-Gil A, Soures N, Neftci E, Mattina M, Lomonaco V, Thiem CD, and Epstein B – "Design Principles for Lifelong Learning AI Accelerators" *Nature Electronics* 6(11), 807-822; November 2023

18. Helfer P, Teeter C, Hill A, Vineyard CM, **Aimone JB**, and Kudithipudi D – "Context Modulation Enables Multi-Tasking and Resource Efficiency in Liquid State Machines" *2023 International Conference on Neuromorphic Systems* 2023

19. **Aimone JB** and Misra S – "Will stochastic devices play nice with others in neuromorphic hardware?" *IEEE Electron Devices Magazine* 1(2); October 2023.

20. Theilman BH, Wang Y, Parekh OD, Severa W, Smith JD, and **Aimone JB** – "Stochastic Neuromorphic Circuits for Solving MAXCUT" – *2023 International Parallel and Distributed Processing Symposium (IPDPS)*, May 2023

21. Theilman BH and **Aimone JB** – "Goemans-Williamson MAXCUT approximation algorithm on Loihi" *Proceedings of the 2023 Neuro Inspired Computational Elements Conference* April 2023

22. **Aimone JB**, Awile O, Diesmann M, Knight JC, Nowotny T, Schurmann F – "Neuroscience, computing, performance, and benchmarks: Why it matters to neuroscience how fast we compute" – *Frontiers in Neuroinformatics*; 17(26); March 2023

23. Cardwell SG, Schuman CD, Smith JD, Patel K, Kwon J, Liu S, Allemang C, Misra S, Incorvia JA, and **Aimone JB** – "Probabilistic Neural Circuits leveraging AI-Enhanced Codesign for Random Number Generation" *2022 International Conference on Rebooting Computing* arXiv:2212.00625

24. Liu S, Kwon J, Bessler PW, Cardwell S, Schuman C, Smith JD, **Aimone JB,** Misra S, and Incorvia JA – "Random Bitstream Generation using Voltage-Controlled Magnetic Anisotropy and Spin Orbit Torque Magnetic Tunnel Junctions" *IEEE Journal on Exploratory Solid-State Computational Devices and Circuits*; 194-202*;* December 2022

25. Misra S, Bland LC, Cardwell SG, Incorvia JA, James CD, Kent AD, Schuman CD, Smith JD, and **Aimone JB** – "Probabilistic Neural Computing with Stochastic Devices" *Advanced Materials* 2022

26. **Aimone JB;** Date P; Fonseca-Guerra G, Hamilton K, Henke K, Kay W, Kenyon G, Kulkarni S, Mniszewski S, Parsa M, Risbud S, Schuman CD, Severa W, Smith JD [*alphabetical*]– "A Review of Non-Cognitive Applications for Neuromorphic Computing" *Neuromorphic Computing and Engineering* 2022

27. Wang F, Teeter C, Luca S, Musuvathy S, and **Aimone JB**, "Distributed Localization with Grid-based Representations on Digital Elevation Models" *2022 International Conference on Neuromorphic Systems (ICONS)* July 2022

28. Severa W, Smith JD, **Aimone JB**, Lehoucq RB, "Learning to parameterize a stochastic process using neuromorphic data generation" *2022 International Conference on Neuromorphic Systems (ICONS)* July 2022

29. Vineyard CM, Cardwell S, Chance FS, Musuvathy S, Rothganger F, Severa W, Smith JD, Teeter CM, Wang FE, and **Aimone JB** – "Neural Mini-Apps as a Tool for Neuromorphic Computing Insight" – *Proceedings of the 2022 Neural Inspired Computational Elements Conference,* March 2022

30. Wang F, Teeter, C, Luca S, Musuvathy S, **Aimone B** – "Localization through Grid-based Encodings on Digital Elevation Models" - *Proceedings of the 2022 Neural Inspired Computational Elements Conference,* March 2022

31. Lindsey J and **Aimone JB** – "Sequence Learning and Consolidation on Loihi using On-chip Plasticity" - *Proceedings of the 2022 Neural Inspired Computational Elements Conference,* March 2022

32. Smith JD, Hill AJ, Reeder LE, Franke BC, Lehoucq RB, Parekh O, Severa W, and **Aimone JB** – "Neuromorphic scaling advantages for energy-efficient random walk computation" –*Nature*

Electronics; February 2022; 5(2) 102-112.

33. **Aimone JB**, Lehoucq RB, Severa W, Smith JD [*alphabetical*] – "Assessing a Neuromorphic Platform for use in Scientific Stochastic Sampling" *Proceedings of the International Conference on Rebooting Computing (ICRC),* November 2021

34. **Aimone JB**, Hill AJ, Severa W, Vineyard CM – "Spiking Neural Streaming Binary Arithmetic" *Proceedings of the International Conference on Rebooting Computing (ICRC),* November 2021

35. **Aimone JB**, Ho Y, Parekh O, Phillips CA, Pinar A, Severa W, Wang Y [*alphabetical*] – "Provable Advantages for Graph Algorithms in Spiking Neural Networks" *Proceedings of 33rd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, August 2021

36. Dias GP, Murphy T, Stangl D, Ahmet S, Morisse B, Nix A, Aimone LJ, **Aimone JB**, Kuro-O M, Gage FH, and Thuret S – "Intermittent fasting enhances long-term memory consolidation, adult hippocampal neurogenesis, and expression of longevity gene Klotho" *Molecular Psychiatry* May 2021

37. **Aimone JB** – "A Roadmap for Reaching the Potential of Brain-Derived Computing" *Advanced Intelligent Systems,* January 2021; 3(1)

38. Cardwell S, Vineyard CM, Severa W, Chance F, Rothganger F, Wang F, Musuvathy S, Teeter CM, and **Aimone JB** – "Truly heterogeneous HPC: co-design to achieve what science needs from HPC" *2020 Smokey Mountains Computational Sciences and Engineering Conference (SMC2020)*

39. Smith JD, Severa W, Hill AJ, Reeder L, Franke B, Lehoucq RB, Parekh O, and **Aimone JB** – "Solving a steady-state PDE using spiking networks and neuromorphic hardware" *2020 International Conference on Neuromorphic Systems (ICONS),* July 2020

40. **Aimone JB**, Ho Y, Parekh O, Phillips CA, Pinar A, Severa W, Wang Y [*alphabetical*] – "Brief Announcement: Provable Neuromorphic Advantages for Computing Shortest Paths" *2020 Symposium on Parallelism in Algorithms and Architectures (SPAA)*, July 2020

41. Kerman, B.E., Genoud, S., Vatandaslar, B.K., Denli, A.M., Ghosh, S.G., Xu, X., Yeo, G.W., **Aimone, J.B.** and Gage, F.H., "Motoneuron expression profiling identifies an association between an axonal splice variant of HDGF-related protein 3 and peripheral myelination." *Journal of Biological Chemistry,* pp.jbc-RA120. July 2020

42. Chance FS, **Aimone JB**, Musuvathy SS, Smith MR, Vineyard CM, Wang F. "Crossing the Cleft: Communication Challenges Between Neuroscience and Artificial Intelligence." *Frontiers in Computational Neuroscience*. 2020 May 6;14:39.

43. Bennett CH, Dellana R, Xiao TP, Feinberg B, Agarwal S, Cardwell S, Marinella MJ, Severa W, **Aimone B.** "Evaluating complexity and resilience trade-offs in emerging memory inference machines". *2020 Neuro-Inspired Computational Elements (NICE).* arXiv preprint arXiv:2003.10396. 2020 Feb 25.

44. **Aimone JB**, Severa W, and Vineyard CM – "Composing Neural Algorithms with Fugu" *2019 International Conference on Neuromorphic Systems (ICONS),* July 2019

45. **Aimone JB**, Parekh O, Phillips C, Pinar A, Severa W, and Xu H [*alphabetical*]– "Dynamic Programming with Spiking Neural Computing" *2019 International Conference on Neuromorphic Systems (ICONS),* July 2019

46. **Aimone JB** – " Neural algorithms and computing beyond Moore's law" –*Communications of the ACM.* April 2019

47. Vineyard CM, Dellana R, **Aimone JB**, Rothganger F, Severa WM – "Low-Power Deep Learning Inference using the SpiNNaker Neuromorphic Platform" *2019 Neuro-Inspired Computational Elements (NICE),* March 2019

48. Severa W, Vineyard CM, Dellana R, Verzi SJ, and **Aimone JB** – "Training Deep Neural Networks for Binary Communication with the Whetstone Method" *Nature Machine Intelligence*. February 2019

49. Quach TT, Agarwal SA, James CD, Marinella M, and **Aimone JB –** "Fast Data Acquisition for Volatile Memory Forensics on Emerging Memory Architectures" – *IEEE Access.* December 2018

50. **Aimone JB**, Hamilton KE, Mniszewski S, Reeder L, Schuman CD, and Severa WM [*alphabetical*]– "Non-neural network applications for spiking neuromorphic hardware" – *Proceedings of Third International Workshop on Post-Moore's Era Supercomputing* 2018

51. Verzi SJ, Rothganger F, Parekh OD, Quach T, Miner NE, Vineyard CM, James CD, and **Aimone JB** – "Computing with Spikes: The advantage of fine-grained timing" *Neural Computation.* 30(10) October 2018

52. Faust A, **Aimone JB,** James CD, and Tapia L – "Resilient Computing with Reinforcement Learning on a Dynamical System: Case Study in Sorting" 2018 *IEEE Conference on Decision and Control (CDC)*

53. Smith MR, Ingram JB, Lamb CC, Draelos TJ, Doak JE, **Aimone JB**, and James CD – "Dynamic Analysis of Executables to Detect and Characterize Malware" – *2018 International Conference on Machine Learning and Applications*, arXiv preprint arXiv:1711.03947

54. Severa W, Lehoucq R, Parekh O, and **Aimone JB** – "Spiking Neural Algorithms for Markov Process Random Walk"- *2018 International Joint Conference on Neural Networks (IJCNN)*

55. Bouchard, K.E., **Aimone, J.B.,** Chun, M., Dean, T., Denker, M., Diesmann, M., Donofrio, D.D., Frank, L.M., Kasthuri, N., Koch, C. and Rübel, O., "International Neuroscience Initiatives through the Lens of High-Performance Computing". *Computer*, 51(4), pp.50-59. 2018.

56. Parekh O, Phillips C, James CD, and **Aimone JB** – "Constant depth and sub-cubic size threshold circuits for matrix multiplication" – *2018 Symposium on Parallel Architectures and Applications (SPAA)*

57. Wang F, Quach TT, Wheeler J, **Aimone JB**, and James CD – "Sparse Coding for N-Gram Feature Extraction and Training for File Fragment Classification" – *IEEE Transactions on Information Forensics and Security.* 13(10), pp. 2553-2562. April 2018

58. **Aimone JB** and Severa WM – "Context-modulation of hippocampal dynamics and deep convolutional networks: Using parallel pathways to limit network size" – *2017 NIPS Cognitive Influenced Artificial Intelligence Workshop;* arXiv preprint arXiv:1711.09876

59. Doak JE, Ingram JB, Mulder SA, Naegle JH, Follett DR, Cox JA, **Aimone JB**, Dixon KR, and James CD – "Tracking cyber adversaries with adaptive indicators of compromise" – *2017 CSCI*

60. Hill AJ, Donaldson JW, Rothganger F, Vineyard CM, Follett DR, Follett PL, Smith MR, Verzi SJ, Severa W, Wang F, **Aimone JB**, Naegle JH, and James CD – "A Spike-Timing Neuromorphic Architecture" – *2017 IEEE International Conference on Rebooting Computing* October 2017

61. **Aimone JB**, Parekh O, and Severa WM – "Neural Computing for scientific computing applications: more than just machine learning" –*2017 Neuromorphic Computing Symposium* July 2017

62. Follett DR, Townsend DCM, Karpman GD, Naegle JH, Suppona RA, **Aimone JB**, and James CD – "Neuromorphic Data Microscope" –*2017 Neuromorphic Computing Symposium* July 2017

63. Draelos TJ, Miner NE, Lamb CC, Vineyard CM, Carlson KD, James CD, and **Aimone JB** – "Neurogenesis Deep Learning"– *2017 International Joint Conference on Neural Networks* May 2017

64. Smith M, Hill A, Carlson KD, Vineyard CM, Donaldson J, Follett DJ, Follett P, Naegle J, James CD, and **Aimone JB** – "A Novel Digital Neuromorphic Architecture Efficiently Facilitating Neural Networks with Complex Synaptic Response Functions" – *2017 International Joint Conference on Neural Networks* May 2017

65. Verzi SJ, Vineyard CM, Vugrin E, Galiardi M, James CD, **Aimone JB** – "Optimization-based Computation with Spiking Neurons" – *2017 International Joint Conference on Neural Networks* May 2017

66. James CD, **Aimone JB**, Miner NE, Vineyard CM, Rothganger FH, Carlson KD, Mulder SA, Draelos TJ, Faust A, Marinella MJ, Naegle JH, and Plimpton SJ – "A historical survey of algorithms and hardware architectures for neural-inspired and neuromorphic computing applications" *Biologically Inspired Cognitive Architectures,* January 2017

67. Severa W, Parekh O, James CD, and **Aimone JB**– "A Combinatorial Model for Dentate Gyrus Sparse Coding" – *Neural Computation,* January 2017

68. Bouchard KE, **Aimone JB**, Chun M, Dean T, Denker T, Diesmann M, Donofrio DD, Frank LM, Kasturi N, Koch C, Ruebel O, Simon HD, Sommer FT – "High-performance computing in Neuroscience for data-driven discovery, integration, and dissemination" *Neuron,* November 2016

69. Du H*, Deng W*, **Aimone JB***, Ge M, Parylak S, Walch K, Cook J, Zhang W, Song H, Wang L, Gage FH, and Mu Y – "Dopaminergic Inputs in the Dentate Gyrus Direct the Choice of Memory Encoding" – *PNAS,* 2016

70. Rothganger F, James CD, and **Aimone JB** – "Computing with Dynamical Systems" – *Proceedings of the IEEE International Conferences on Rebooting Computing* October 2016

71. Severa W, Parekh O, Carlson KD, James CD, and **Aimone JB** – "Spiking Network Algorithms for Scientific Computing" – *Proceedings of the IEEE International Conference on Rebooting Computing* October 2016

72. Draelos TJ, Miner NE, Cox JA, Lamb CC, James CD, and **Aimone JB** – "Neurogenic Deep Learning" *Proceedings of the International Conference on Learning Representations* 2016

73. Dieni CV, Panichi R, **Aimone JB**, Kuo CT, Wadiche JI, and Overstreet-Wadiche L – "Low Excitatory Innervation Balances High Intrinsic Excitability of Immature Dentate Neurons" *Nature Communications,* 7(11313), April 2016

74. Vineyard CM, Verzi SJ, James CD, and **Aimone JB** – "Quantifying Neural Information Content: A Caste Study of the Impact of Hippocampal Adult Neurogenesis" *Proceedings of the International Joint Conference on Neural Networks,* July 2016

75. Agarwal S, Quach T, Parekh OD, Hsia AH, Debenedictis EP, James CD, Marinella M, and **Aimone JB** – "Energy Scaling Advantages of Resistive Memory Crossbar Based Computation and its Application to Sparse Coding" *Frontiers in Neuromorphic Engineering.* January 2016

76. Cox JA, James CD, and **Aimone JB** – "A Signal Processing Approach for Cyber Data Classification with Deep Neural Networks" *Complex Adaptive Systems - Procedia Computer Science.* 61, November 2015

77. Vineyard CM, Verzi SJ, James CD, **Aimone JB**, and Heileman GL – "Repeated Play of the SVM Game as a Means of Adaptive Classification" *Proceedings of International Joint Conference on Neural Networks (IJCNN)* July 2015

78. Vineyard CM, Verzi SJ, James CD, **Aimone JB**, and Heileman GL – "MapReduce SVM Game" *INNS Conference on Big Data - Procedia Computer Science.* 53, August 2015

79. Rothganger F, Evans BR, **Aimone JB**, and Debenedictis EP – "Training neural hardware with noisy components" *Proceedings of International Joint Conference on Neural Networks (IJCNN)* July 2015

80. **Aimone JB,** Li Y, Lee SW, Clemenson GD, Deng W, and Gage FH – "Regulation and Function of Adult Neurogenesis: from Genes to Cognition" *Physiological Reviews* October 2014 (**Cover Article; ISI Web of Knowledge Highly Cited Paper**)

81. Rothganger F, Warrender CE, Trumbo D, and **Aimone JB** – "N2A: a novel computational tool for modeling from neurons to algorithms" *Frontiers in Neural Circuits.* January 2014

82. Rangel LM, Alexander AS, **Aimone JB**, Wiles J, Gage FH, Chiba AA, and Quinn LK – "Temporally selective contextual encoding in the dentate gyrus of the hippocampus" *Nature Communications.* January 2014

83. **Aimone JB** and Weick J – "Perspectives for computational modeling of cell replacement for neurological disorders" *Frontiers in Computational Neuroscience.* October 2013

84. Rangel LM, Quinn L, Chiba AA, Gage FH and **Aimone JB** -"A Hypothesis for Temporal Coding of Young and Mature Granule Cells" *Frontiers in Neurogenesis.* 7(75), May 2013

85. Li Y, Stam FJ, **Aimone JB**, Goulding M, Callaway EM, and Gage FH – "Molecular layer perforant path-associated cells contribute to feed-forward inhibition in the adult dentate gyrus" *PNAS.* 110(22), May 2013

86. Li Y*, **Aimone JB*,** Xu X, Callaway EM, and Gage FH – "Development of GABAergic inputs controls the contribution of maturing neurons to the adult hippocampal network" *PNAS.* 109(11), March 2012.

87. **Aimone JB,** Deng W, and Gage FH – "Resolving New Memories: A Critical Look at the Dentate Gyrus, Adult Neurogenesis, and Pattern Separation" *Neuron.* 70(4), May 2011. (**ISI Web of Knowledge Highly Cited Paper)**

88. **Aimone JB** and Gage FH – "Modeling new neuron function: a history of using computational neuroscience to study adult neurogenesis" *European Journal of Neuroscience.* 33(6), March 2011.

89. **Aimone JB,** Deng W, and Gage FH – "Put Them Out to Pasture? What Are Old Granule Cells Good for, Anyway…?" *Hippocampus.* 20(10), October 2010.

90. **Aimone JB***, Deng W*, and Gage FH – "Adult neurogenesis: integrating theories and separating functions" Featured Review for *Trends in Cognitive Sciences.* 14(7), July 2010 (**Cover Article; ISI Web of Knowledge Highly Cited Paper**).

91. Deng W*, **Aimone JB***, and Gage FH – "New neurons and new memories: How does adult hippocampal neurogenesis affect learning and memory?" *Nature Reviews Neuroscience.* 11(5), May 2010. (**ISI Web of Knowledge Highly Cited Paper**)

92. **Aimone JB**, Wiles J, and Gage FH – "Computational Influence of Adult Neurogenesis on Memory Encoding" *Neuron*, 61(2), January 2009. (**Faculty of 1000 Biology**)

93. Smrt RD, Eaves-Egenes J, Barkho BZ, Santistevan NJ, Zhao C, **Aimone JB**, Gage FH, and Zhao X - "Mecp2 deficiency leads to delayed maturation and altered gene expression in hippocampal neurons" *Neurobiology of Disease,* 27(1), April 2007.

94. Toni N, Teng EM, Bushong EA, **Aimone JB,** Zhao C, van Pragg H, Martone ME, Ellisman MH, and Gage FH – "Synapse formation on neurons born in the adult hippocampus." *Nature Neuroscience.* 10(6), June 2007. (**Faculty of 1000 Biology; ISI Web of Knowledge Highly Cited Paper**)

95. **Aimone JB**, Wiles J, and Gage FH - "Potential Role for Adult Neurogenesis in the Encoding of Time in New Memories." *Nature Neuroscience*, 9(6), June 2006. (**Faculty of 1000 Biology; ISI Web of Knowledge Highly Cited Paper**)

96. Barkho BZ, Song H, **Aimone JB**, Smrt RD, Kuwabara T, Nakashima K, Gage FH, and Zhao X - "Identification of astrocyte-expressed factors that modulate neural stem/progenitor cell differentiation." *Stem Cell and Development*, 15(3), June 2006.

97. Myers CP, Lewcock JW, Hanson MG, Gosgnach S, **Aimone JB**, Gage FH, Lee KF, Landmesser LT, and Pfaff SL – "Cholinergic Input is Required during Embryonic Development to Mediate Proper Assemby of Spinal Locomotor Circuits." *Neuron,* 46(1), April 2005.

98. **Aimone JB***, Leasure JL*, Perreau VM*, Thallmair M* and the Christopher Reeve Paralysis Foundation – "Spatial and Temporal Gene Expression Profiling of the Contused Rat Spinal Cord" *Experimental Neurology,* 189(2), October 2004 (**Cover Article**).

99. **Aimone JB** and Gage FH,– "Unbiased Characterization of High-densisty Oligonucleotide Microarrays Using Probe-Level Statistics" *Journal of Neuroscience Methods*, 135(1-2), May 2004.

100. Hsieh J, **Aimone JB**, Kaspar BK, Kuwabara T, Nakashima K and Gage FH– "IGF-1 Instructs Multipotent Adult Stem Cells to Become Oligodendrocytes" *Journal of Cell Biology,* 164(1). January 2004.

101. Coffer JL, Montchamp JL, **Aimone JB**, and Weis RP – "Routes to Calcified Porous Silicon: Implications for Drug Delivery and Biosensing" *Physica. Status. Solidi. (a)* 197, No.2. 2003.

SUBMITTED ARTICLES & PRE-PRINTS (5)

1. Zador, A, et al. "NeuroAI and Beyond: Bridging Between Advances in Neuroscience and Artificial Intelligence." arXiv preprint arXiv:2604.18637 (2026).

2. Wang F, Theilman BH, Rothganger F, Severa W, Vineyard CM, and **Aimone JB** – "Neuromorphic Simulation of Drosophila Melanogaster Brain Connectome on Loihi 2" – arXiv preprint arXiv:2508.16792

3. **Aimone JB** – "Neuromorphic Computing: A Theoretical Framework for Time, Space, and Energy Scaling" – arXiv preprint arXiv:2507.17886

4. Theilman BH, Wang F, Rothganger F, **Aimone JB** – "Decomposing spiking neural networks with Graphical Neural Activity Treads" – arXiv preprint arXiv:2306.16684

5. Severa WM, Timlin JA, Kholwadwala S, James CD, **Aimone JB** – "Data-driven Feature Sampling for Deep Hyperspectral Classification and Segmentation" –arXiv preprint arXiv:1710.09934

BOOK CHAPTERS, NEWS & VIEWS, INVITED COMMENTARIES, OTHER CONFERENCE PROCEEDINGS & ARTICLES

1. Wang F and **Aimone JB** – "On the path towards brain-scale simulations" *Nature Computational Science* December 2024

2. **Aimone JB** and Agarwal S – "Overcoming the noise in neural computing" *Science,* 383 (6685) 832-833

3. Koppens FHL, **Aimone JB**, and Chance FS – "2D materials ratchet up biorealism in computing", *Nature*, 624, 534-536 (2023)

4. **Aimone JB** and Parekh O – "The brain's unique take on algorithms", *Nature Communications*, 14(1), August 2023

5. Green S and **Aimone JB** – "Memristors Learn to Play" *Nature Electronics,* March 2019

6. Carlson KD, Rothganger F, and **Aimone JB** – "Computational perspectives on adult neurogenesis" *The Rewiring Brain: A Computational Approach to Structural Plasticity in the Brain,* San Diego: Academic Press, 2017.

7. **Aimone JB** - "Computational Modeling of Adult Neurogenesis." *Adult Neurogenesis* Cold Spring Harbor Perspectives, Cold Spring Harbor, NY, 2016.

8. Marinella MJ, Mickel PR, Lohn AJ, Hughart DR, Bondi R, Mamaluy D, Mjalmarson H, Stevens JE, Decker S, Apodaca R, Evans B, **Aimone JB**, Rothganger F, James CD, and Debendictis EP – "Development, Characterization, and Modeling of a TaOx ReRAM for a Neuromorphic Accelerator", *ESC Transactions*, 64 (14) 2014

9. Lohn AJ, Mickel PR, **Aimone JB**, Debenedictis EP, and Marinella MJ – "Memristors as synapses in artificial neural networks: Biomimicry beyond weight change" In *Cybersecurity Systems for Human Cognition Augmentation*. 2014

10. **Aimone JB**, Deng W, and Gage FH – "Adult Neurogenesis in the Dentate Gyrus" *Space, Time, and Memory in the Hippocampal Formation*, Springer, ed. Jim Knierim and Dori Derdikman. 2014

11. Vineyard, C.M, Verzi SJ, Caudell TP, Bernard ML, & **Aimone, J. B.**, - "Adult neurogenesis: Implications on Human and Computational Decision Making". In *Foundations of Augmented Cognition* (pp. 531-540). Springer Berlin Heidelberg. 2013

12. **Aimone JB** and Wiskott L - "Computational Modeling of Adult Neurogenesis." *Adult Neurogenesis* (Chapter 22) Cold Spring Harbor Press, Cold Spring Harbor, NY, 2008.

13. Jessberger S, **Aimone JB**, and Gage FH - "Neurogenesis." *Learning and Memory: A Comprehensive Reference* (Chapter 42) Elsevier Limited, Oxford UK ed. John H. Byrne. 2008

14. Jessberger S, Aigner S, **Aimone JB**, and Gage FH – "Adult Neural Progenitor Cells in CNS Function and Disease" *CNS Regeneration, 2nd Edition.* ed. Jeffrey Kordower & Mark Tuszynski Elsevier, London UK 2008.

15. **Aimone JB**, Jessberger S, and Gage FH - "Adult Neurogenesis." *Scholarpedia*. 2(2):2100. 2007.

SEMINARS AND CONFERENCE PRESENTATIONS

SELECTED INVITED SEMINARS AND KEYNOTE TALKS

1. 2024 National Institutes of Health Wednesday Afternoon Lecture Series; Bethesda MD, October 2024 – "From New Neurons to New Chips: How Neuromorphic Computing Can Help Us Understand the Brain" *Invited Seminar Speaker*

2. Open Neuromorphic Workshop Seminar Series; December 2023 - "Programming Scalable Neuromorphic Algorithms with Fugu"

3. 2023 International Conference on Neuromorphic, Natural and Physical Computing (Keynote Talk); October 2023 – "The Pursuit of the Brain's Ubiquitous Stochasticity"

4. 2023 Mathematics of Scientific Machine Learning (Keynote Talk); June 2023 – "A Probabilistic Future for Neuromorphic Computing"

5. Texas A&M University – TEES Tech Talk; February 2023 – "Full Stack Neuromorphic"

6. University of California Davis - Brain, AI, and Neuromorphic Computing Distinguished Speaker Seminar Series; January 2023 – "A Probabilistic Future for Neuromorphic Computing"

7. Sandia Loves Science; October 2022 – "A Probabilistic Future for Neuromorphic Computing"

8. ValleyML AI Expo (Keynote Talk); 2020 – "Preparing for the Next Generation of Brain-Inspired AI"

9. University of Texas Austin Bio-Inspired Computing Colloquium; 2019 – "Preparing for the Next Generation of Brain-Inspired AI"

10. University of Texas San Antonio AI Summit (Keynote Talk); 2019 – "Preparing for the Next Generation of Brain-Inspired AI"

11. University of Irvine Center for Neurobiology of Learning and Memory Colloquium Series; 2019 – "Computing as a Constraint to Understand the Hippocampus"

12. University of Utah Snowbird Symposium; 2018 – "Computing as a Constraint to Understand the Brain: A Case Study in Neural Plasticity"

13. University of New Mexico Applied Math Seminar Series; 2018 – "Novel approaches to numerical computing using neural algorithms

14. University of New Mexico Neuroscience Seminar Series; 2016 – "Revisiting the canonical model of the hippocampus"

15. Keystone Meeting on Adult Neurogenesis; 2014 – "Are New Neurons in Humans Important? How Scale Affects Neurogenesis Function"

16. UC Irvine Center for Neurobiology of Learning and Memory 2014 Spring Meeting – "Revisiting a Model: Continually Reassessing the Computational Role of Adult Neurogenesis"

17. Boston University Biomedical Engineering Seminar Series 2013 – "Adult Hippocampal Neurogenesis: Memory Resolution, Pattern Separation, or Both?"

18. University of Illinois Urbana-Champaign Neuroscience Program Seminar Series 2013 – "Adult Hippocampal Neurogenesis: Memory Resolution, Pattern Separation, or Both?"

19. Virginia Tech Carilion Research Institute 2012 – "Translating new neurons from mice to humans: the computational neuroscience of scale"

20. University of New Mexico Neuroscience Seminar Series; 2012 – "Computational Function of Adult Neurogenesis and the Dentate Gyrus"

NOTABLE MEETING PRESENTATIONS

1. 2026 Purdue Neuroscience, Neurotechnology, and Neuro-AI Symposium (PN3); West Lafayette, IN; May 2026 – "The Dawn of Neuromorphic Algorithms" *Invited Talk*

2. 2026 Energy Consequences of Information Workshop; Santa Fe, NM; February 2026 – "A Theoretical Framework for Time, Space, and Energy Scaling in Neuromorphic Systems" *Invited Talk*

3. 2025 Santa Fe Institute Workshop on Neuromorphic Stochastic Thermodynamics; Santa Fe, NM; December 2025 – "A Random Walk Through Probabilistic Neuromorphic Algorithms" *Invited Talk*

4. 2025 NSF BRAID Workshop: Bridging Neuroscience and Engineering for Energy-Efficient AI; San Diego, CA, December 2025 – "Is neuromorphic computing ready to deliver on its promise to advance neuroscience?" *Invited Talk*

5. 2025 IEEE-EMBS Conference on Neural Engineering; San Diego CA, November 2025 – "Is neuromorphic computing ready to deliver on its promise to advance neuroscience?" *Invited Talk*

6. 2025 ModSim Workshop; Seattle WA, August 2025 – "Is Neuromorphic computing Ready for Prime Time?" *Invited Talk*

7. 2025 Georgia Tech CRNCH Summit; Atlanta GA, February 2025 – "A Probabilistic Future for Neuromorphic Computing" *Invited Talk*

8. 2024 NIH BRAIN Initiative NeuroAI Workshop; Bethesda MD, November 2024 – "How Neuromorphic Computing Can Help Us Understand the Brain" *Invited Talk*

9. 2024 Neuromorphic Principles of Biomedicine and Healthcare (NPBH); Baltimore MD, October 2024 - "From New Neurons to New Chips: How Neuromorphic Computing Can Help Us Understand the Brain" *Invited Talk*

10. 2024 IEEE Brain Discovery and Neurotechnology Workshop; Chicago IL, October 2024 - "From New Neurons to New Chips: How Neuromorphic Computing Can Help Us Understand the Brain" *Invited Talk*

11. 2023 Telluride Neuromorphic Workshop; July 2023 – "A Probabilistic Future for Neuromorphic Computing" *Invited Talk*

12. 2024 IEEE International Symposium on Roadmapping Devices and Systems; May 2024 (Virtual) – "The COINFLIPS Project" *Invited Talk*

13. 2023 14th Workshop on Scalable Algorithms for Large-Scale Heterogeneous Systems (ScalAH'23); Denver, CO November 2023 – "The Pursuit of the Brain's Ubiquitous Stochasticity" *Invited Talk*

14. 2022 Santa Fe Institute Workshop on The Thermodynamics of Natural and Artificial Distributed Computational Systems – "Neuromorphic Computing" *Invited Talk*

15. 2022 ICONS Conference, Special Session on Neuromorphic Computing for Optimization Problems; Knoxville, TN; July 2022 – "The Future of Neuromorphic Computing" *Invited Talk*

16. NSF Workshop on Large Scale Neuromorphic Computing; (Virtual) July 2022 *Invited Panelist*

17. Intel Neuromorphic Research Consortium Community Highlights; (Virtual) April 2022 – "Monte Carlo Simulations on Loihi"

18. CINT Annual Meeting; (Virtual) September 2022 – "A Probabilistic Future for Neuromorphic Computing" *Invited Talk*

19. 2022 Salishan HPC Conference; (Virtual) April 2022 – "How Probabilistic Neuromorphic Computing May Impact Scientific Computing Applications" *Invited Talk*

20. Physics-Informed Learning Machines for Multiscale and Multiphysics (PhILMs) Center Symposium; 2021 - "Recipes and Tools for Neuromorphic Computing"

21. 2022 NICE Conference; virtual – "Coinflips: CO-designed Improved Neural Foundations Leveraging Inherent Physics Stochasticity"

22. DARPA MEC Workshop on Biological Computing; January 2022 *Invited Participant*

23. 2021 NICE Conference; Heidelberg, Germany (online) – "A numerical computing future for neuromorphic computing) *Presentation*

24. 2019 NICE Workshop; Albany, NY; James B. Aimone – "Mosaics"

25. 2018 International Conference on Neuromorphic Systems (ICONS), Knoxville, TN - Aimone JB, Hill A, Lehoucq R, Parekh O, Reeder L, and Severa WM – "Neuromorphic Hardware Implementation of Spiking Algorithms for Markov Random Walks" *Presentation*

26. 2018 NICE Workshop; Hillsboro, OR; James B Aimone – "Direct Application of Neuromorphic Computing to Numerical Computing" *Presentation*

27. 2017 NICE Workshop; San Jose, CA; James B Aimone – "Hippocampus Inspired Adaptive Neural Algorithms" *Presentation*

28. 2016 Gage Laboratory Symposium; La Jolla, CA; James B Aimone – "What are new neurons good for; both in your brain and on your cell phone" *Presentation*

29. Society for Neuroscience 2016; San Diego, CA; C.M. Vineyard, J.B. Aimone, M.R. Smith, S.J. Verzi, J. Donaldson, G. Popoola, F. Wang, D.R. Follett, C.D. James, & J.H. Naegle – "A neurally inspired spiking temporal processing unit computational architecture" *Poster*

30. Society for Neuroscience 2016; San Diego, CA; W. Severa, O. Parekh, C.D. James & J.B. Aimone – "Formalizing function within the hippocampal triysynaptic circuit" *Poster*

31. Society for Neuroscience 2016; San Diego, CA; K.D. Carlson & J.B. Aimone – "Applying uncertainty quantification and sensitivity analysis to spiking neural network models of asynchronous irregular firing activity" *Poster*

32. 2016 Neuromorphic Computing Workshop: Architectures – Models – Applications; Oak Ridge, TN James B Aimone, Kristofor D Carlson, & Fred Rothganger – "Neural Computing: What Scale and Complexity is Needed"? *Presentation*

33. 2016 NICE Workshop; Berkeley, CA; James B Aimone – "Modulating Neural Computation" *Presentation*

34. Society for Neuroscience 2015; Chicago IL; James B Aimone, Conrad D James, and Christina E Warrender – "Dimensionality reduction of cortical spiking networks – quantifying the structure behind the chaos" *Poster*

35. Society for Neuroscience 2015; Chicago IL; C.M. Vineyard, S.J. Verzi, C.D. James, & J.B. Aimone – "Quantifying neural information content: A case study of the impact of hippocampal adult neurogenesis through computational modeling" *Poster*

36. Society for Neuroscience 2015; Chicago IL; F. Rothganger & J.B. Aimone – "Neural circuit models on emulated hardware" *Poster*

37. 2015 NICE Workshop; Bernalillo, NM; James B Aimone – "Adaptive Neural Algorithms: The What, Why, and How" *Presentation*

38. 2013 Gage Laboratory Symposium; La Jolla CA;James B Aimone – "Neurogenesis Inspired Computing" *Presentation*

39. Society for Neuroscience 2013; San Diego, CA; W. Deng, Y. Mu, J.B. Aimone & F.H. Gage – "Dopamine modulates memory encoding in the dentate gyrus of the hippocampus" *Poster*

40. Society for Neuroscience 2013; San Diego, CA; T.H. Hutson, L.D.F. Moon, R.E. Van Kesteren, K Iffland, J. Torres-Munoz, C.K. Petito, J.B. Aimone, W.J. Buchser, V.P. Lemmon, J.L. Bixby, A.B. Smit, F.H. Gage, & M.B. Bunge – "Laser microdissection of in vivo regenerating spinal neurons identifies genes including ptpn2 that promote neurite outgrowth and axon regeneration" *Poster*

41. Society for Neuroscience 2013; San Diego, CA; F. Rothganger, D. Trumbo, C. Warrender, and J.B. Aimone – "A computable database for neural model generation" *Poster*

42. Society for Neuroscience 2013; San Diego, CA; C.M. Vineyard & J.B. Aimone – "Computational modeling of human adult neurogenesis – information theoretic analysis of biologically realistic dentate gyrus networks" *Poster*

43. COSYNE 2013; Salt Lake City, UT James Aimone* & Craig Vineyard – "How neurogenesis and the scale of the dentate gyrus affect the resolution of memories" *Poster*

44. Society for Neuroscience 2012; New Orleans, LA James B. Aimone*, Dan Sepp, Corinne M Teeter, Craig M. Vineyard, Michael L. Bernard, and Fred H. Gage – "Modeling human adult neurogenesis: The role of scale in biologically realistic dentate gyrus networks" *Poster; highlighted in SfN Media Summary*

45. Society for Neuroscience 2012; New Orleans, LA; C. Warrender, J.B. Aimone, C. Teeter, & R. Schiek – "Population activity in large recurrent networks" *Poster*

46. Society for Neuroscience 2012; New Orleans, LA; F. Rothganger, D. Trumbo, C. Warrender, J.B. Aimone & C. Teeter – "A computable database for neural model generation" *Poster*

47. 36th Winter Conference on the Neurobiology of Learning and Memory 2012; Park City, Utah "Pattern separation or pattern resolution? Computational and behavioral approaches to addressing the functional role of the dentate gyrus"

48. International Symposium on Learning, Memory, and Cognitive Function 2011; Valencia, Spain "Adult hippocampal neurogenesis. Role in learning and memory"

49. COSYNE 2011; Salt Lake City, UT James Aimone* & Fred Gage – "More is better: the relationship of neural network size and adult neurogenesis" *Poster*

50. Society for Neuroscience 2010; San Diego, CA J.B. Aimone*, L. Rangel, & F.H. Gage – "Neural network model of adult neurogenesis reveals that dentate gyrus oscillations may help dissociate immature from mature granule cells during in vivo recordings" *Poster*

51. Society for Neuroscience 2010; San Diego, CA; D. Stangl, B. Morisse, S. Ahmet, L.J. Aimone, J.B. Aimone, F.H. Gage, S. Thuret – "Adult hippocampal neurogenesis and behavior are altered by diet in mice. What is the role of Klotho?" *Nanosymposium*

52. Society for Neuroscience 2010; San Diego, CA; L.M. Rangel, L.K. Quinn, J.B. Aimone, F.H. Gage, & A.A. Chiba – "Selective spatial encoding in the dentate gyrus and the contribution of adult neurogenesis" *Poster*

53. COSYNE 2010; Salt Lake City, UT James Aimone* & Fred Gage - "How neurogenesis and modulation affect network oscillations in a large-scale dentate gyrus model." *Poster*

54. NSF Science of Learning Centers PI Meeting, November 2009; Washington, DC

55. Salk Science Day & Faculty Symposium 2008; La Jolla, CA "The Computational Impact of Adult Neurogenesis in the Dentate Gyrus on Memory Formation"

56. COSYNE 2008; Salt Lake City, UT James Aimone*, Janet Wiles, Fred Gage – "The Computational Impact of Adult Neurogenesis in the Dentate Gyrus on Memory Formation" *Poster*

57. Society for Neuroscience 2007; San Diego, CA J.B. Aimone*, J. Wiles, & F.H. Gage – "A computational model of the effects of adult neurogenesis on memory formation in the hippocampus" *Platform Presentation*

58. Computational Cognitive Neuroscience 2007; San Diego, CA; J.B. Aimone, W. Deng, J. Wiles & F.H. Gage – "Neural network modeling of adult neurogenesis and its effects on memory formation" *Poster*

59. Society for Neuroscience 2006; Atlanta, GA; J.B. Aimone, J.L. Elman, J. Wiles & F.H. Gage – "Computational role of adult neurogenesis in long-term function of the dentate gyrus" *Poster*

60. 2005 Learning and Memory Meeting, Cold Spring Harbor Laboratory, NY - James B. Aimone*, Janet Wiles, Jeff Elman and Fred H. Gage - "Computational Function of Neurogenesis in the Dentate Gyrus" *Presentation*

61. Society for Neuroscience 2005; Washington, DC; Moon, L. D. F.; Torres-Munoz, J. E.; Petito, C. K.; Aimone, J. B.; Lein, E. S.; Gage, F. H.; & Bunge, M. B. – "Identification of genes expressed by spinal cord neurons regenerating an axon into a Schwann cell bridge transplanted after thoracic transection: microarray analysis of retrogradely labeled, laser captured neurons." *Slide Presentation*

62. Society for Neuroscience 2003; New Orleans LA; J.B. Aimone, J.L. Leasure, V. Perreau, M. Thallmair, & Christopher Reeve Paralysis Foundation – "Spatial and temporal gene expression profiling of the contused spinal cord: multi-method analysis and effects on Cholesterol metabolism." *Poster*

63. Society for Neuroscience 2003; New Orleans LA; J. Hsieh, J.B. Aimone, B.K. Kaspar, T. Kuwabara, K. Nakashima, F.H. Gage – "IGF-1 instructive effects in the differentiation of adult multipotent neural stem cells to an oligodendroglial lineage" *Poster*

64. 2003 Affymetrix GeneChip Microarrary Low-Level Workshop; Berkeley, CA; James B. Aimone & Fred H. Gage – "Characterization of the Significance of Expression Changes in GeneChip System using Probe-Level Statistics" *Poster*

MAGAZINE ARTICLES & PODCASTS

1. Brains & Machines Podcast, Sunny Bains – "Episode 32: Brad Aimone" October 2025 https://brainsandmachines.net/brad-aimone/

2. Brain Inspired Podcast, Paul Middlebrooks – "Episode 41 – Brad Aimone: Neurogenesis and Spiking in Deep Nets" July 2019 https://www.patreon.com/posts/bi-041-brad-and-118022026

3. James B. Aimone - “Brain-Inspired Computing Pushes the Boundaries of Technology,” R&D Magazine. June 2017 https://www.rdmag.com/article/2017/06/brain-inspired-computing-pushes-boundaries-technology

4. Brad Aimone - “Adult Neurogenesis: More than Just an Interesting Phenomenon,” Scientific American Mind. August 2007; Mind Matters blog (ed. David Dobbs) on Scientific American Online. https://www.scientificamerican.com/article/new-brain-cells-go-to-work/