ANN M HERMUNDSTAD, PHD

CONTACT INFORMATION

Group Leader
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EDUCATION & TRAINING

Department of Physics, **Colorado School of Mines**, Golden, Colorado USA

Dates	2002-2006
Degree	BS in Engineering Physics, Minor in Mathematics
Advisor	Lincoln Carr
Field	Quantum physics

Department of Physics, **University of California, Santa Barbara**, Santa Barbara, CA, USA

Dates	2007-2012
Degree	PhD in Theoretical Physics
Advisor	Jean Carlson
Field	Statistical physics, complex systems

Department of Physics, **University of Pennsylvania**, Philadelphia, PA, USA
Department of Physics, **École Normale Supérieure**, Paris, France

Dates	2012-2016
Position	Postdoctoral Researcher
Advisor	Vijay Balasubramanian
Field	Theoretical neuroscience

POST-TRAINING POSITIONS

Janelia Research Campus, Ashburn, VA, USA

Dates	2016-present
Position	Group Leader
Area	Computation & Theory

PREPRINTS

†Corresponding author

NY AbdelRahman, W Jiang, LT Coddington, S Gong, JT Dudman†, **AM Hermundstad**†, Composing trajectories for rapid inference of navigational goals (2025), *bioRxiv*, doi:10.1101/2025.09.24.678123.

LL Grima, Y Guo, L Narayan, **AM Hermundstad**, JT Dudman†, A global dopaminergic learning rate enables adaptive foraging across many options (2024), *bioRxiv*, doi:10.1101/2024.11.04.621923.

H Haberkern†, SS Chitnis, P Hubbard, T Goulet, **AM Hermundstad**, V Jayaraman†, Maintaining a stable head direction representation in naturalistic visual environments (2022), *bioRxiv*, doi:10.1101/2022.05.17.492284.

PUBLICATIONS

D Goldschmidt, Y Guo, SS Chitnis, C Christoforou, D Turner-Evans, Carlos Ribeiro, **AM Hermundstad**, V Jayaraman, H Haberkern†, Recent experience and internal state shape local search strategies in flies (2026), *Curr. Biol.*, doi:10.1016/j.cub.2026.02.037.

AM Hermundstad†, WF Młynarski†, Theory of rapid behavioral inferences under the pressure of time (2026), *PRX Life*, doi:10.1103/8m59-vf2m.

Y Guo†, **AM Hermundstad**†, Efficient planning and implementation of optimal foraging strategies under energetic constraints (2026), *PNAS Nexus*, doi:10.1093/pnasnexus/pgag009.

Y Guo†, **AM Hermundstad**†, Environmental dynamics impact whether matching is optimal (2026), *PNAS Nexus*, doi:10.1093/pnasnexus/pgaf392.

C Dan, BK Hulse, R Kappagantula, V Jayaraman†, **AM Hermundstad**†, A neural circuit architecture for rapid learning in goal-directed navigation (2024), *Neuron*, doi:10.1016/j.neuron.2024.04.036.

T Ma† and **AM Hermundstad**†, A vast space of compact strategies for effective decisions (2024), *Science Advances*, doi:10.1126/sciadv.adj4064.

M Noorman†, BK Hulse, V Jayaraman, S Romani, **AM Hermundstad**†, Maintaining and updating accurate internal representations of continuous variables with a handful of neurons (2024), *Nat. Neurosci.*, doi:10.1038/s41593-024-01766-5.

AM Hermundstad†, Normative approaches to neural coding and behavior (2024), *SciPost Physics Lecture Notes*, doi:10.21468/SciPostPhysLectNotes.83.

JA Charlton, WF Młynarski, YH Bai, **AM Hermundstad**, RLT Goris†, Environmental dynamics shape perceptual decision bias (2023), *PLoS Comput. Biol.*, doi:10.1371/journal.pcbi.1011104.

CF Angeloni, WF Młynarski, E Piasini, AM Williams, KC Wood, L Garami, **AM Hermundstad**, MN Geffen†, Dynamics of cortical contrast adaptation predict perception of signals in noise (2023), *Nat. Commun.*, doi:10.1038/s41467-023-40477-6.

K Krishnamurthy, **AM Hermundstad**, T Mora, A Walczak, V Balasubramanian, Disorder and the neural representation of complex odors (2022), *Front Comput. Neurosci.*, doi:10.3389/fncom.2022.917786.

WF Młynarski†, **AM Hermundstad**†, Efficient and adaptive sensory codes (2021), *Nat Neurosci* 24, doi:10.1038/s41593-021-00846-0.

BK Hulse†, H Haberkern†, R Franconville†, DB Turner-Evans†, S Takemura, T Wolff, M Noorman, M Dreher, C Dan, R Parekh, **AM Hermundstad**, GM Rubin, V Jayaraman†, A connectome of the *Drosophila* central complex reveals network motifs suitable for flexible navigation and context-dependent action selection (2021), *eLife* 10:e66039, doi:10.7554/eLife.66039.

KL Kadhim, **AM Hermundstad**, KS Brown†, Structured patterns of activity in pulse-coupled oscillator networks with varied connectivity (2021), *PLoS ONE* 16(8):e0256034, doi:10.1371/journal.pone.0256034.

R Gong, S Xu, **AM Hermundstad**, Y Yu, SM Sternson†, Hindbrain Double-Negative Feedback Mediates Palatability- Guided Food and Water Consumption (2020), *Cell* 182(6), doi:10.1016/j.cell.2020.07.031.

T Tesileanu, M Conte, JJ Briguglio, **AM Hermundstad**, JD Victor†, V Balasubramanian†, Efficient coding of natural scene statistics predicts discrimination thresholds for grayscale textures (2020), *eLife* 9:e54347, doi:10.7554/eLife.54347.

SS Kim†, **AM Hermundstad**, S Romani, LF Abbott, V Jayaraman†, Generation of stable heading representations in diverse visual scenes (2019), *Nature* 576, doi:10.1038/s41586-019-1767-1.

W Młynarski†, **AM Hermundstad**†, Adaptive coding for dynamic sensory inference (2018), *eLife* 7:e32055, doi:10.7554/eLife.32055.

Y Sun, A Nern, R Franconville, H Dana, ER Schreiter, LL Looger, K Svoboda, DS Kim†, **AM Hermundstad**†, V Jayaraman†, Neural signatures of dynamic stimulus selection in *Drosophila* (2017), *Nature Neuroscience* 20(8), doi:10.1038/nn.4581.

AM Hermundstad†, JJ Briguglio, M Conte, JD Victor, G Tkačik, V Balasubramanian, Variance predicts salience in central sensory processing (2014), *eLife* 3:e03722, doi:10.7554/eLife.03722.

AM Hermundstad†, KS Brown, DS Bassett, EM Aminoff, S Freeman, D Clewett, C Tipper, A Johnson, MB Miller, ST Grafton, JM Carlson, Structurally-constrained relationships between cognitive states in the human brain (2014), *PLoS Comput. Biol.*, 10(5):e1003591, doi:10.1371/journal.pcbi.1003591.

AM Hermundstad†, KS Brown, DS Bassett, EM Aminoff, S Freeman, D Clewett, C Tipper, A Johnson, MB Miller, ST Grafton, JM Carlson, Structural foundations of resting-state and task-based functional connectivity in the human brain (2013), *Proc. Natl. Acad. Sci. USA*, 110(15):6169–6174, doi:10.1073/pnas.1219562110.

AM Hermundstad†, KS Brown, DS Bassett, JM Carlson, Learning, memory, and the role of neural network architecture (2011), *PLoS Comput. Biol.*, 7(6):e1002063, doi:10.1371/journal.pcbi.1002063.

AM Hermundstad†, EG Daub, JM Carlson, Energetics of strain localization in a model of seismic slip (2010), *J. Geophys. Res.*, 115:B06320-1–9, doi:10.1029/2009JB006960.

DR Dounas-Frazer, **AM Hermundstad**, LD Carr†, Ultracold bosons in a tilted multilevel doublewell potential (2007), *Phys. Rev. Lett.*, 99(20):200402-1–4, doi:10.1103/PhysRevLett.99.200402.

HONORS

2015	Burroughs Wellcome Career Award at the Scientific Interface
2012	Chair's Fellowship, Physics Department, UCSB
2011	Philanthropic Education Organization National Scholar Award
2007-2010	Government Assistance in Areas of National Need Fellowship, UCSB
2009	School for Scientific Thought Fellowship, UCSB
2008	Let's Explore Applied Physics and Mathematics Fellowship, UCSB

PROGRAM ORGANIZATION

2016-present	*Co-organizer*, Junior Scientist Workshop in Theoretical Neuroscience, Janelia
2020,2021,2024	*Program Committee Member*, Cosyne Annual Meeting
2021-2023	*Program Committee Member*, Bernstein Conference in Computational Neuroscience
2021	*Co-Organizer*, 4D Cellular Physiology Workshop, Janelia
2021	*Co-Organizer*, Women in Computational Biology Conference, Janelia
2017-2020	*Co-Coordinator*, Systems Neuroscience Seminar Series, Janelia
2018	*Co-Organizer*, Summer School on Mathematical Analysis of Behavior, Janelia/Mathematical Sciences Research Institute
2017	*Co-Organizer*, Junior Scientist Workshop in Neural Circuits and Behavior, Janelia
2015	*Co-Organizer*, Symposium on 'Emergence: Compelling Examples and Unified Approaches', University of Michigan
2009	*Co-Creator*, School for Scientific Thought, UCSB

TEACHING

2023	*Instructor*, Biophysics Summer School, École de Physique des Houches, Les Houches, France
2020	*Instructor*, Cosyne Meeting Tutorial, Denver CO
2020	*Instructor*, NeuroNex Workshop Tutorial, University of Houston
2019	*Instructor*, Cajal Computational Neuroscience Course, Champalimaud
2010	*Instructor*, School for Scientific Thought, UCSB
2010	*Guest Instructor*, Summer Institute in Mathematics and Science, UCSB

MENTORING	2021-present	*Mentor*, Chalk Talk Your Independent Research Program (ChIRP), Janelia
	2019-present	*Mentor*, Junior Scientist Seminar Series (JSSS), Janelia
	2019-present	*Thesis Committee Member*, Janelia/Johns Hopkins, University of Colorado, NYU, Columbia, LMU Munich
	2018-present	*Mentor*, Women's Mentoring Circle, Janelia
	2018	*Speaker/Panelist*, Career Development Workshop, University of Maryland
SCIENTIFIC REVIEW	2022-present	*Scientific Advisory Panel*, Freeman Hrabowski Scholar Program
	2021-2024	*External Advisory Board Member*, NIH BRAIN U19
	2012-present	*Ad-hoc Reviewer*, PNAS, Nature Neuroscience, Current Biology, eLife, Physical Review Letters, Physical Review E, PLoS Computational Biology, PLoS ONE, Cosyne, German Israeli Foundation for Scientific Research and Development
	2014-2016	*Scientific Editorial Advisor*, 'From Photon to Neuron: Light, Imaging, Vision' and 'Physical Models of Living Systems', by Philip Nelson