

Hermann Riecke
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Northwestern University
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Professional Preparation

U. Munich, Germany	Physics	Diploma (magna cum laude), 1983
U. Bayreuth, Germany	Physics	Ph.D. (summa cum laude), 1986
U. Bayreuth, Germany	Physics	Scientific Assistant, 1986-1987
U. California San Diego	Institute for Nonlinear Science	Postdoctoral Fellow, 1987-1989

Appointments

Northwestern University	Engg. Sci. & Appl. Math.	Professor (2000–present)
Max Planck Institute for Medical Research, Heidelberg		Visiting scientist (2005–2006)
Northwestern University	Engg. Sci. & Appl. Math.	Assoc. Professor (1994–2000)
Northwestern University	Engg. Sci. & Appl. Math.	Asst. Professor (1989–1994)

Honors and Awards:

- Humboldt Research Award of the Alexander-von-Humboldt Foundation, Germany (2005)
Fellow, American Physical Society (2001)
Postdoctoral fellowship of the German Science Foundation (1987–1988).
Prize of the Emil-Warburg-Foundation for Outstanding Doctoral Dissertation (1986).

Research Interests:

Computational neuroscience:

- adaptive neuronal networks
- information processing and plasticity in the olfactory system
- neural dynamics in the retina

Dynamical systems with many degrees of freedom:

- Synchronization of oscillators
- Pattern formation, spatio-temporal chaos, bifurcation theory with symmetry

Selected Publications (total 86)

1. W. Adams*, J.N. Graham*, X. Han*, H. Riecke
Top-down inputs drive neuronal network rewiring and context-enhanced sensory processing in olfaction PLoS Comp. Biology 15 (2019) e1006611. * undergraduate participation
2. J.H. Meng, H. Riecke
Synchronization by uncorrelated noise: interacting rhythms in networks of oscillator networks Scientific Reports, 8 (2018) 6949.

3. A.J. Karamchandani, J.N. Graham*, H. Riecke
Pulse-coupled mixed-mode oscillators: Cluster states and extreme noise sensitivity Chaos 28 (2018) 043115.
4. K.A. Sailor, M.T. Valley, M.T. Wiechert, H. Riecke, G.J. Sun, W. Adams, J.C. Dennis, S. Sharafi, G.-L. Ming, H. Song, P.-M. Lledo
Persistent Structural Plasticity Optimizes Sensory Information Processing in the Olfactory Bulb. Neuron, 91 (2016) 384.
5. K. Gowda, H. Riecke, M. Silber
Transitions between Patterned States in Vegetation Models for Semiarid Ecosystems
Phys. Rev. E 89 (2014) 022701.
6. H. Choi, L. Zhang, M.S. Cembrowski, C.F. Sabottke, A.L. Markowitz, D.A. Butts, W.L. Kath, J.H. Singer, H. Riecke
Intrinsic Bursting of AII Amacrine Cells Underlies Oscillations in the rd1 Mouse Retina
J. Neurophysiol. 112 (2014) 1491.
7. J.-B. Ke, Y. V. Wang, B.G. Borghuis, M.S. Cembrowski, H. Riecke, W.L. Kath, J.B. Demb, J.H. Singer, *Adaptation to Background Light Enables Contrast Coding at Rod Bipolar Cell Synapses.* *Neuron* 81 (2014) 388–401.
8. M.T. Wiechert, B. Judkewitz, H. Riecke, R.W. Friedrich
Mechanisms of Pattern Decorrelation by Recurrent Neuronal Circuits
Nature Neurosci. 13 (2010) 1003–1010.
9. A. Roxin, H. Riecke, S.A. Solla
Self-Sustained Activity in a Small-World Network of Excitable Neurons
Phys. Rev. Lett. 92 (2004) 198101
10. H. Riecke
Self-Trapping of Traveling-Wave Pulses in Binary Mixture Convection
Phys. Rev. Lett. 68 (1992) 301.

Synergistic Activities

2000–2005 Co-Director (with S.A. Solla) of the NSF-IGERT-Program
Dynamics of Complex Systems in Science and Engineering

2007–2011 Co-organizer, Computational & Systems Neuroscience journal club
 (with M.J.Z Hartmann)

NSF panels: CRCNS, DMS Mathematical Biology, DMS CAREER, CMMI, NCS, IGERT.

NIH panels: NIH Blueprint Training in Computational Neuroscience, NIH Kirschstein NRSA.

American Physical Society:

Member: selection committee for the F.N. Frenkiel Award for Fluid Mechanics (2002-2003), Fellowship. Committee of the Division of Fluid Dynamics (2004-2005), Fellowship Committee of the Topical Group on Statistical & Nonlinear Physics (2016-2017).

Outreach: *Applied Math in Action* for high-school students, partially in cooperation with the Schuler Scholar Program (2008-2019); IJAS Region 6 Science Fair judge, 2014.

Mentoring

7 postdoctoral associates. 10 PhD students have graduated, 1 ABD; currently supervising 3 PhD students. 13 undergraduates have participated in research.

December 5, 2019