

Sara Helms Cahan

Curriculum Vitae

Current Position : Associate Professor and Chair,
Department of Biology, University of Vermont

University address: Department of Biology
Marsh Life Sciences 307A
University of Vermont
Burlington, VT 05405

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Fax: (802) 656-2914

E-mail: scahan@uvm.edu

Education:

1999 Ph.D. Zoology, Arizona State University, Tempe, AZ
Co-advisors: Steven W. Rissing and Jennifer H. Fewell
Major field: Behavioral Ecology

1992 B.S. Biology, University of Michigan, Ann Arbor, MI

Areas of Specialization:

Social insect biology and evolution, ecological genetics, behavioral ecology

Professional Employment:

2015 - current Chair, Department of Biology, University of Vermont
2010 – current Associate Professor, Department of Biology, University of Vermont
2004-2010 Assistant Professor, Department of Biology, University of Vermont
July 2000 - Postdoctoral Research Associate (with Laurent Keller)
Aug. 2004 University of Lausanne, Switzerland
February- Post-doctoral Research Assistant (with S. Bradleigh Vinson)
June 2000 Department of Entomology, Texas A&M University
1993 – 1999 Teaching Assistant
Department of Biology, Arizona State University

Teaching Experience:

2005 - current BioCore 012 Exploring Biology (4 credits), lecture and lab
Biology 095 First-year Teacher-Advisor-Program seminar “Natural
History of the Family” (3 credits)
Biology 276 Behavioral Ecology (3 credits)
Biology 277 Sociobiology (3 credits)
Biology 381 Ecological Genetics (1 credit graduate colloquium)
Levels of Selection (graduate colloquium)
Foundational Readings in Social Evolution (graduate
colloquium)

- Honors 086 First-year Honors seminar: Knowledge in the Age of Big Data (3 credits)
- Honors 196 Sophomore Honors seminar: Natural History of The Family (3 credits)

Grants:

- 2018-2022 National Science Foundation/EPSCoR, RII Track-2 FEC: From Genome to Phenome in a Stressful World: Epigenetic regulatory mechanisms mediating thermal plasticity in *Drosophila*. Awarded to S. HelmsCahan (PI), Seth Fietze, James Water, Heather Axen, Nicholas Teets (co-PIs), Brent Lockwood (Faculty Associate) (\$4,771,722).
- 2016 -2018 National Institutes of Health R03: Chagas disease transmission: Genomic studies of the kissing bug *Triatoma infestans* to enhance control strategies for a neglected tropical disease. Awarded to L. Stevens and S. Helms Cahan (\$155,000).
- 2013-2014 National Science Foundation, Bro3-(4 (t)-2 on2j7(s))4 0(i)-270(i)-270(iu1s5J0 Tc 0 Tw -26.8

1994, 1995 Research Grants, Arizona State University Dept. of Zoology (\$360, \$300)

Refereed, Peer-Reviewed Publications:

1. Lecheta, M. C. Awde, D. N., O'Leary, T., Unfried, L. N., Jacobs, N. A., Whitlock, M. H., McCabe, E., Powers, B., Bora, K., Waters, J. S., Axen, H. J., Fietze, S., Lockwood, B. L., Teets, N. M., Helms Cahan, S. 2020. GWAS and transcriptomics to identify the molecular underpinnings of thermal stress responses in *Drosophila melanogaster*. *Frontiers in Genetics*: article 658.
2. Hanley, J., Rizzo, D., Stevens, L., Helms Cahan, S., Dorn, P., Morrissey, L., Rodas, A., Orantes, L., Monroy, M. C. 2020. Novel Evolutionary Algorithm Identifies Interactions Driving Infestation of *Triatoma dimidiata*, a Chagas Disease Vector. *Amer. J. Trop. Med. Hygiene* 103:735-744.
3. Helms Cahan, S., Orantes, L.C., Wallin, K., Rizzo, D. M., Stevens, L., Dorn, P. L., Rodas, A. G., Monroy, C. 2019. Residual survival and local dispersal drive reinfestation by *Triatoma dimidiata* following insecticide application in Guatemala. *Infection, Genetics and Evolution* 70:4000.
4. Nguyen, A. D., Brown, M., Zitnay, J., Helms Cahan, S., Gotelli, N. J., Arnett, A., Ellison, A. A. 2019. Trade-offs in cold physiology at the northern range edge of the common woodland ant *Aphaenogaster picea*. *The American Naturalist* 194:E151-163.
5. Lau, M. K., Ellison, A. A., Nguyen, A. D., Penick, C., DeMarco, B. B., Gotelli, N. J., Sanders, N. J., Dunn, R., Helms Cahan, S. 2019. Draft *Aphaenogaster* genomes expand our view of ant variation across climate gradients. *PeerJ* 7e6447.
6. Orantes, L., C. Monroy, P. L. Dorn, L. Stevens, D. Rizzo, L. Morissey, J. P. Hanley, B. Richards, A. G. Rodas, K. F. Williams (in press) *The Ecology of *Triatoma dimidiata* in Guatemala*. *Journal of Tropical Medicine and Hygiene* 144(1)

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response is associated with acclimation to novel temperatures but not adaptation to climatic variation in the ants *Aphaenogaster picea* and *A. rudis*. *Comparative Biochemistry and Physiology part A* 204:113-120.

12. Diamond, S.E., L. M. Nichols, S. L. Pelini, C. Penick, S. Helms Cahan, G. Barber, R. R. Dunn, Aaron M. Ellison, N. J. Sanders, and N. J. Gotelli, 2016. Climate warming destabilizes forest ant communities. *Science Advances* 2:1600842.
13. Stanton-Geddes, J., A. D. Nguyen, L. Chick, J. Vincent, M. Vangala, R. R. Dunn, A. M. Ellison, N. J. Sanders, N. J. Gotelli, and S. Helms Cahan 2016. Thermal reactionomes reveal divergent responses to thermal extremes in warm and cool-climate ant species. *BMC Genomics* DOI: 10.1186/s12864-

25. Helms Cahan, S. and K. R. Helms 2012. Relatedness does not explain geographic variation in queen cooperation in the seed-harvester ant *Messor pergandei*. *Insectes Sociaux* 59:579-585.
26. Helms, K. R. & S. Helms Cahan 2012. Large scale regional variation in cooperation, conflict, group size, and cooperative breeding among queens of the desert ant *Messor pergandei*. *Animal Behaviour* 84:499-507.
27. Helms Cahan, S., Graves, C. J., Brent, C. S., 2011. Intergenerational effect of maternal juvenile hormone on offspring in *Pogonomyrmex* harvester ants. *Journal of Comparative Physiology B* 181:991-999.
28. Helms Cahan, S., Daly, A. M., Schwander, T., Woods, H. A. 2010. Genetic caste determination does not reduce colony growth rates in *Pogonomyrmex* harvester ants. *Functional Ecology* 24:301-309.
29. Helms Cahan, S., Julian, G. E. 2010. Shift in frequency-dependent selection across the life-cycle in obligately interbreeding harvester ant lineages. *Evolutionary Ecology* 24:359-374.
30. Helms, K. R. and S. Helms Cahan, 2009. Divergence in mating flight patterns of the seed-harvester ant *Pogonomyrmex rugosus* Emery, (1895) in the western Mojave Desert. *Myrmecological News* 13:15-17.
31. Schwander, T., Helms Cahan, S., S. Suni, Keller, L. 2008. Mechanisms of reproductive isolation between an ant species of hybrid origin and its parents. *Evolution* 62:1635-1643.
32. Schwander, T., Humbert, J.-Y., Brent, C. S., Helms Cahan, S., Chapuis, L., Renai, E., Keller, L. 2008. Maternal effect on female caste determination in a social insect. *Current Biology* 18:265-269.
33. Schwander, T., Keller, L., Helms Cahan, S. 2007. Two alternate mechanisms contribute to the persistence of interdependent lineages in *Pogonomyrmex* harvester ants. *Molecular Ecology* 16:3533-3543.
34. Schwander, T., Helms Cahan, S., Keller, L. 2007. Characterization and distribution of *Pogonomyrmex* harvester ant lineages with genetic caste determination. *Molecular Ecology* 16:367-387.
35. Helms Cahan, S. Julian, G. E., Schwander, T., Keller, L. 2006. Reproductive isolation between the harvester ant *Pogonomyrmex rugosus* and two lineages with genetic caste determination. *Ecology* 87:2160-2170.
36. Julian, G. E., Helms Cahan, S. 2006. Behavioral differences between *Pogonomyrmex rugosus* and two dependent lineages (H1/H2). *Ecology* 87:2207-2214.
37. Schwander, T., Helms Cahan, S., Keller, L. 2005. Genetic caste determination in *Pogonomyrmex* harvester ants imposes costs during colony founding. *Journal of Evolutionary Biology* 19:402-409.
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Herrmann, M. and S. Helms Cahan. Contact during mating reduces cues for mate discrimination in the socially hybridogenetic “J” lineages of the ant *Pogonomyrmex barbatus*. Draft in progress, for *Insectes Sociaux*

Invited Seminars/Papers:

- 2018 International Union for the Study of Social Insects International Congress (invited symposium speaker)
University of New Hampshire
- 2017 Entomological Society of America Annual meeting, invited symposium speaker
- 2014 Entomological Society of America Annual meeting, invited symposium speaker
- 2010 International Congress of the International Union for the Study of Social Insects, Copenhagen, Denmark (invited talk)
- 2009 Boston University
- 2008 University of Nevada, Las Vegas
- 2007 University of Massachusetts, Amherst
- 2006 Entomological Society of America Annual Meeting, Invited Symposium
- 2005 University of New Hampshire, Durham, NH
- 2004 University of Illinois, Champaign-Urbana, IL
- 2003 Entomological Society of America Annual Meeting, Invited Symposium
(G.E. Julian and S. Helms Cahan)
SUNY StonyBrook, NY
Vanderbilt University, Nashville, TN
- 2002 University of Copenhagen, Copenhagen, Denmark
- 2001 Animal Behavior Society Annual Meeting, Invited Symposium (J.H. Fewell and S. Helms Cahan)
- 2000 University of Würzburg, Germany 2(-)3 (2C)-7600

Member of Biology Department Advisory Committee, 2005-2006

Member of Biology Department Graduate Affairs Committee, 2005-2006

Faculty Advisor, Zoology, Environmental Sciences and Biology Network, 2005-2006

Faculty Advisor, tri-Beta National Biology Honors Society, 2006-2012

Post-doctoral advisor for:

Yihong Zhou (2010-2013)

John Stanton-Geddes (co-mentored with N. Gotelli, 2013-2014)

Ph.D. Advisor for:

Heather Axen (graduated August 2011)

Fernando Gelin (graduated May 2014)

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American Society of Naturalists
Entomological Society of America
International Society for Behavioral Ecology
International Union for the Study of Social Insects