CURRICULUM VITAE

**Jon Fewell Harrison**

School of Life Sciences

Arizona State University

Tempe, AZ 85287-4501

j.harrison@asu.edu

# EDUCATION

 1982-1987 Ph.D. Environmental, Population and Organismal Biology

 University of Colorado, Boulder

 Thesis Advisor: Dr. Todd T. Gleeson

 1978 University of Pittsburgh, School of Medicine: Medicine

 1976-1978 B.S. Biology

 University of Toronto

 1973-1975 Biology

 University of Virginia

# MAJOR RESEARCH INTERESTS

Respiratory physiology: evolution and mechanisms

Metabolic and nutritional physiology: evolution and mechanisms

Effects of body size (scaling): evolution and mechanisms

Social insect physiology and behavior

Effects of environmental change on pollinators and other coupled human and natural systems

Environmental toxicology

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# PROFESSIONAL EXPERIENCE

**ARIZONA STATE UNIVERSITY**

|  |  |
| --- | --- |
| 2012 - 2013  | Assistant Vice-President, Research Infrastructure & Facilities  |
|   | Office of Knowledge Enterprise Development  |
| 2010 - 2013  | Director of Research Infrastructure & Facilities  |
|   | Office of Knowledge Enterprise Development  |
| 2011-2013  | University Research Integrity Officer  |
|   | Arizona State University  |
| 2011-2013  | Institutional Official for Animal Care  |
|   | Arizona State University  |
| 2005 - 2009  | Associate Director of Facilities  |
|   | School of Life Sciences  |
| 2002 - Present  | Professor  |
|   | School of Life Sciences  |
| 1997 - 2002  | Associate Professor  |
|   | Department of Biology  |
| 1991 – 1997  | Assistant Professor  |
|    | Department of Zoology  |

**UNIVERSITY OF BRITISH COLUMBIA**

1988-1990 Postdoctoral Fellow, Department of Zoology

 Postdoctoral supervisor: Dr. John E. Phillips

# MEMBERSHIPS IN SCIENTIFIC SOCIETIES

American Physiological Society

Entomological Society of America

International Union for the Study of Social Insects Society for Integrative and Comparative Biology

# HONORS

 2023 Behavioral Plasticity Research Institute Annual Meeting Plenary

Speaker, College Station, TX

2022 Distinguished Arizona Physiologist Lecture, Arizona Physiological Society

 2020-2024 Chair-Elect and Chair, Division of Comparative Physiology and

Biochemistry, Society for Integrative and Comparative Biology

 2018-19 President, Arizona Physiological Society

 2017 Kjell Johansen Lecture 2017, Aarhus, Denmark.

 2016 August Krogh Plenary Lecture, American Physiological Society

 2015 ASU Faculty Women’s Association Mentor Award

 2010 ASU Parent’s Professor of the Year: Special Recognition

 2010 ASU Graduate Mentor of the Year

2009 Selected member of Faculty of 1000 in Biology (Physiological Ecology)

 2005 Elected Fellow of the American Association for the

 Advancement of Science

 1990 The Scholander Award (Best paper by a young investigator)

 American Physiological Society, Orlando, FL

 1989-90 Izaak Walton Killam Postdoctoral Fellowship

 1988-89 National Science Foundation (NATO) Postdoctoral Fellowship

# NATIONAL/INTERNATIONAL SCIENTIFIC OFFICES & SERVICES

Co-organizer (with Nicolas Pichaud and Daniel Matias Gonzalez Tokman) symposium on Physiology of insects in a warming world: from cellular to ecological and evolutionary responses for the 2024 meeting of the International Congress of Entomology, Kyoto.

Co-organizer (with Caroline Williams and Lisa Dreidel) symposium on Insect Flight for the 2024 meeting of the Society for Integrative Biology.

Member, NSF IOS grant panel, 2023

Member, USDA/AFRI grants panel, 2022

Co-organizer (with Phil Matthews) symposium on Insect Tracheal Systems for the American Physiological Society’s conference on Comparative Physiology: From Organisms to Omics in a Changing World, 2022.

American Physiological Society Postdoctoral Fellow Program Oversite Committee member 2022.

Co-organizer (with Karen Kapheim) symposium on Protecting Pollinators and Our Food Supply: Understanding and Managing Threats to Pollinator Health for the 2022 Meeting of the International Union for the Study of Social Insects.

Co-organizer (with Meghan Duell) symposium on Causal Mechanisms of Interspecific Patterns in Metabolic Scaling, selected as a Society-Level Symposium for the Society for Integrative and Comparative Biology (SICB) annual meeting, 2022.

Member, Organizing Committee for the 2022 Meeting of IUSSI (International

Union for the Study of Social Insects)

Member, NSF IOS Review Panel, Fall 2021.

Co-organizer (with Adrian Fisher) symposium on Sublethal Effects of

Agrochemicals on Pollinators, Physiology, Biochemistry and Toxicology Section of the Entomological Society of the America annual meeting, 2020

Chair-Elect and Chair, Division of Comparative and Physiological Biology Section,

Society for Integrative and Comparative Biology, 2020 - 2024

Member, USDA NIFA Competitive Grants Award Panel Fall, 2019

Editorial Board Committee member, Annual Review of Entomology (2019-23)

President, Arizona Physiological Society (2018-19)

Co-organizer (with Leslie Buck) symposium on Comparative Insights into Animal Responses to Hypoxia and Anoxia” American Physiological Society Intersociety Meeting in Comparative Physiology (held October, 2018, New Orleans).

Steering Committee Member, APS International Congress in Comparative

Physiology (2014)

Co-Organizer (with Kendra Greenlee) American Society for Physiology symposium at Experimental Biology, Boston, 2015 on “Effect of Changing Climate on Insect Respiration”

Co-Organizer (with Sherry Tamone) Society for Integrative and Comparative

Biology 2015 symposium and workshop on “Physiology of the Pancrustaceae”

Organizer - XXIV International Congress of Entomology Symposium:

“Mechanisms of regulation of growth rate, size and shape in insects” Daegu, Korea, 2012

Program Officer - Society for Integrative and Comparative Biology: 2011-2013

Organizer and Leader - NSF-Funded Workshops:

“Variable Atmosphere Laboratory (VAL) for Climate Change Research” February, 2008 and August, 2009

Leader - Collaborative Development Team, Advanced X-ray Imaging Facility:

Argonne National Labs

2008-2010

Chair, Organizing Committee - American Physiological Society Intersociety

Meeting: Comparative and Evolutionary Physiology 2007-2010

Associate Editor - Physiological and Biochemical Zoology 2007 – Present

Chair - Scholander Award Selection Committee:

American Physiological Society

2006

Program Officer - Comparative and Evolutionary Physiology

American Physiological Society

2006-2009

Organizing Committee - International Congress in Comparative Physiology

American Physiological Society

2004-2005

Panel Member - Integrative Animal Biology

National Science Foundation

2005

Co-Organizer (with S. Hetz & T. Bradley) - International Congress in Entomology

Symposium “O2 uptake, H2O loss and oxygen radical production: finding balance” Brisbane, Australia, 2004

Co-Organizer (with R. Sterner) - Society for Integrative and Comparative Biology Cross-Society Symposium “Integrated research challenges: Biological stoichiometry from genes to ecosystems” Toronto, 2003

Panel Member - Environmental and Evolutionary Physiology

National Science Foundation,

2000, 2005

Program Officer - Division of Comparative Physiology and Biochemistry

Society for Integrative and Comparative Biology 2000-2003

Editorial Board - Physiological and Biochemical Zoology 1999-2007

Best Student Paper Judge - Division of Comparative Physiology and Biochemistry

Society for Integrative and Comparative Biology

Chicago, 2000

Scholander Award Competition Judge - Division of Comparative Physiology

American Physiological Society

San Diego, 2000

Organizer - 21st International Entomological Congress Symposium “Spiracular mechanisms: ultrastructure and physiology” Brazil, 2000

Organizer – Society for Integrative and Comparative Biology symposium

"Responses of terrestrial invertebrates to variation in temperature and water availability: molecular, organismal, and evolutionary approaches" Albuquerque, 1996

Guest-Editor - *Physiological Zoology*, volume 67

Symposium "Respiratory and ionic aspects of insect acid-base regulation" 1994

Co-Organizer (with J. E. Phillips) - American Society of Zoologists symposium

"Insect Acid-Base Regulation"

Vancouver, 1992

Nominating Committee - Division of Comparative Physiology and Biochemistry

American Society of Zoologists

1990-91

# REVIEWER FOR

 Human Frontiers Science Program

National Science Foundation

National Institute of Health

NSERC

Israeli Academy of Sciences

South African Academy of Sciences

South African Science Foundation

Acta Mechanica

Aging Cell

American Journal of Physiology

American Naturalist

Arthropod Structure &

Development

Behavioral Ecology and

Sociobiology

Bioletters

Bioscience

Canadian Entomologist

Comparative Biochemistry &

Physiology

Current Biology

Developmental Biology

Ecology

Ecology and Evolution

Ecosphere

Ecology Letters

Environmental Monitoring &

Assessment

Evolution

Experientia

Functional Ecology

Geobiology

Heredity

Insectes Sociaux

Journal of Applied Physiology

Journal of Comparative Physiology

Journal of Experimental Biology Journal of Experimental Zoology

Journal of Evolutionary Biology

Journal of Insect Behavior

Journal of Insect Physiology

Journal of Heredity

Insect Molecular Biology

Insectes Sociaux

International Journal of Insect

Morphology

Integrative and Comparative

Biology

Metabolomics

Nature

Naturwissenshaften

Pesticide Biochemistry and Physiology

Physiological and Biochemical

Zoology

Oecologica

PLOS Biology

PLOS Genetics

PLOS One

Proceedings of the National

Academy of Sciences USA

Proceedings of the Royal Society of

London B

Respiratory Biology and

Neurobiology

Science

Scientific Reports

Trends in Ecology and Evolution

**GRANTS AND AWARDS** ($14.8M TOTAL**)**

2022-2023 USDA NIFA Conference grant: synthesis and networking to improve pollinator health at IUSSI 2022. $49,997 (Karen Kapheim PI, Co-I’s Harrison, Evans, Giray, Li-Byarlay).

 2021-2022 National Science Foundation

SICB Conference/Workshop on Causal Mechanisms of Metabolic

Scaling. $13,703 NSF IOS 2141592

 2022-2025 USDA (NIFA) 2022-67013-36285

Climatic warming and fungicide effects on honey bees. Co-PIs: Brian Smith, Jennifer Fewell and Yun Kang. $681,708.

 2020-2023 National Science Foundation

Collaborative research: Brain size, metabolism and sociality in ants. IOS-1953419. $597,872.

 2019-2020 Defense Advanced Research Projects Agency (DARPA).

 Energy-efficient neuromorphic computing in light of the structural and functional evolution of multiscale insect brains. PI: Brian Smith, Co-PI’s: Ted Pavlic, Kevin Cao, Maxim Bazhenov. Phase I and II: $1,000,000.

 2018-2020 National Science Foundation.

 Testing macronutrient imbalance as a key factor limiting range expansion in herbivores. Co-PI: Arianne Cease. IOS-1826848. $120,000

2017-2022 USDA. Evaluation of the dose-response of honey bees to carboximide and strobilurine fungicides: from cellular mechanism to integrated management. USDA 2017-68004-26322. Co-PI’s: Jennifer Fewell, Brian Smith, Osman Kaftangolu, Gloria DeGrandi-Hoffman. $932,284.

 2016-21 National Science Foundation.

 Social scaling: allometry of work and metabolism in ant colonies. Co-

I’s: Jennifer H. Fewell and Y. Kang. NSF IOS 1558127. $500,000

 2016-21 National Science Foundation

The mechanical linkage of respiration, circulation and digestion in beetles. Co-I’s: John Jake Socha and Laura Miller. NSF IOS 1558052. Total budget: $910,00, ASU budget $287,146.

2015 National Science Foundation award to the Society for Integrative and Comparative Biology. PIs: Jon Harrison and Sherry Tamone.

Breaking Boundaries for Evolutionary Synthesis: An Interactive and Integrative Symposium Linking Crustacean and Insect Physiology-

West Palm Beach, Florida; January, 2015. NSF IOS 1507854. $9,900.

2013-2015 HHS-NIH-NIGMS Integrating physiological and genetic mechanisms of body size regulation. Postdoc fellowship to Dr. Viviane Callier. $98,418 (declined)

 2013-2017 National Science Foundation

 SEES Fellowship: Living with locusts. Postdoc fellowship to Dr.

Arianne Cease. $339,921

 2013-2018 National Science Foundation

CNH: Living with locusts: linking livestock markets and grazing practices with the nutritional ecology of grasses and locusts under alternative property rights regimes. Co-I’s: Arianne Cease, James

Elser, Eli Fenechel, Brian Robinson, Joleen Hadrich

NSF DEB 13033608 - $955,569

 2013-2017 National Science Foundation

Collaborative research: Is hypoxia a critical cue for molting? Co-I: Alexander Shingleton

 NSF IOS 1256745 and 1446302 - $554,991

 2012-2013 National Science Foundation

 Research Experiences for Undergraduates

 Supplement to IOS 1122157 - $5,750

 2012-2013 National Science Foundation

 Research Experiences for Teachers

 Supplement to IOS 1122157 - $6,125

 2012-2013 National Science Foundation

 Research Experiences for High School Students

 Supplement to IOS 1122157 - $18,150

 2011-2014 National Science Foundation

 Structural and functional scaling of the respiratory system of flying Beetles; IOS 1122157 - $625,308

 2011-2012 National Science Foundation

Dissertation Research: Metabolic and behavioral integration in social insect colonies. James S. Waters and Jon F. Harrison. IOS 1110796 - $14,078

 2010-2012 National Science Foundation

 International DDEP: Grasshopper migration in the Asian steppe:

 Investigating diet as a cue for developmental polyphenism.

 Arianne J. Cease, James J. Elser and Jon F. Harrison.

 OISE 1026182 - $14,988

 2010-2014 National Science Foundation

EFRI BSBA: Complex microsystem networks inspired by internal insect physiology NSF 0938047 - $1,992,607 Jake Socha (VA Tech) Jon Harrison (ASU) portion of budget: $390,51

 2009-2010 National Science Foundation

Workshop: Variable Atmosphere Laboratory 2 IOS-0929344 - $28,840

 2008-2010 NASA Cooperative Agreement NNX08AO88G - $87,737

 Improved prediction of Africanized honeybee abundance, distribution, and migration in the US and honeybee climate responses using satellite-derived land-cover type phonological data

 2007-2008 National Science Foundation

 Workshop to evaluate and design a variable atmosphere laboratory

 IOS 0748882 - $13,076

 2009-2011 National Science Foundation

 REU supplement to NSF EAR 0746352 - $30,000

 2008-2011 National Science Foundation EAR 0746352 - $500,000

 Atmospheric oxygen effects on the body size of fossil modern insects

 2006-2011 DARPA DOD 3000654843 - $295,133

 Synthetic vertebral implant for cyborg insects

 (Subcontract from University of Michigan)

 2004-2009 National Science Foundation IBN 0419704 -$633,725

 Atmospheric oxygen effects on insect body size and tracheal

 function

 2003-2004 National Science Foundation Supplement to IBN 0419704 - $14,000

 Research Experience for Undergraduates

 2002 Deutscher Akademischer Austausch Dient $5,000

 Humbold Universität

 2002-2004 Doctoral Dissertation Improvement Grant IBN-0206678 - $9,951

 Kendra Greenlee and Jon F. Harrison. Effects of body size and development on gas exchange.

2001-2003 Beckman Scholars Program, Beckman Foundation $106,500

 (this award funds undergraduate research in Biology, Chemistry &

 Biochemistry at ASU)

2001-2003 National Science Foundation IBN-0104959 - $10,000. Doctoral Dissertation Improvement Grant. Scott Kirkton and Jon F. Harrison. Mechanisms and significance of ontogenetic changes in respiratoryfunction during insect locomotion.

2001-2005 National Science Foundation IBN 0093410 - $435,000. Genotypic and phenotypic variation in foraging behavior of African and European honey bees, Co-PI: J.H. Fewell.

2001-2002. National Science Foundation. Supplement to IBN 9985857 - $10,000. Research Experience for Undergraduates

2000-2004 National Science Foundation, IBN 9985857. $405,000. Body size and tracheal function

1999-2003 National Science Foundation. DEB 9977047. $2,842,162. IRCEB Biological stoichiometry from genes to ecosystems. Co-I; PI James Elser.

1998-2000 National Science Foundation. IBN 9728444. $150,000. Body size and tracheal function in insects.

1999 Arizona State University CLAS Travel Award Travel to International Union of Social Insects Meeting Adelaide, Australia - $900.

1998-1999 National Science Foundation. IBN 9728444. $20,000. Research Experience for Undergraduates Supplement.

1994-1998 National Science Foundation. IBN 9317784 - $35,32. Research Experience for Undergraduates Supplement.

1997-1999 United States Dept of Agriculture Competitive Research Award . 97-35302-4395 - $95,000. Mechanisms of colony growth and reproduction in African and European honey bees”. Co-PI: Jennifer H. Fewell

1996-1997 National Science Foundation. $5,985. SICB Symposium: Responses of terrestrial invertebrates to variation in temperature and water availability: molecular, organismal, and evolutionary approaches.

1994-98 National Science Foundation. IBN 9317784. $304,000. Insect acid-base regulation

1995-97 National Science Foundation. IBN-9521543 - $9,960. Dissertation Improvement Grant Stephen P. Roberts and Jon F. Harrison

1991-94 National Science Foundation. DCB-9020284. $180,519. Insect acid-base regulation

1994 Arizona State University CLAS Travel Award. International Union of Social Insects meeting Paris, France - $500

1992-1993 National Science Foundation. DCB-9020284 - $8,000. Research Experience for Undergraduates Supplement.

1992 National Science Foundation. $6,000. SICB Symposium on Respiratory and ionic aspects of acid-base regulation in insects Vancouver, British Columbia"

1992 National Science Foundation. $170,000. Analytical Laboratory for Research in Environmental Biology with N.B. Grimm, J.J. Elser, J.H. Fewell, S.G. Fisher, T.M. Markow, M.C. Moore, G. Walsberg:

# INVITED LECTURES AND SYMPOSIA PRESENTATIONS (93 TOTAL)

2024 American Physiological Society Summit, Long Beach, CA. PhysioHub Plenary. The essential role of physiology in sustaining ecosystem health.

2023 Behavioral Plasticity Research Institute Annual Symposium Plenary speaker. Behavioral, physiological and fitness responses to environmental challenges in pollinators.

2022 Universität Rostock. Online Seminar Series in Biolocomotion. Scaling and thermal effects on the energetics of insect flight.

2021 North Dakota State University, Depart of Biological Sciences. Do our current regulations protect pollinators from pesticides? A case study with a commonly-used fungicide.

 Society for Integrative and Comparative Biology on Causal Mechanisms of Metabolic Scaling (I organized the symposium, gave the introductory remarks, and was an author on one presentation).

2020 Western Ontario University, Department of Biology. Interactions between body size, metabolic rate and oxygen in animal physiology.

 Entomological Society of America symposium on Sublethal Effects of Agrochemicals on Pollinators (I organized this symposium, gave introductory remarks and moderated the panel discussion, and was an author on four of the presentations).

2019 Penn State, Department of Entomology. Challenges in assessing and interpreting insect responses to environmental stress.

 University of Arizona, Ecology and Evolutionary Biology. Why does aerobic metabolic rate scale hypometrically in animals?

2018 Barrett College-School of Mathematical and Natural Sciences, Arizona State University West Colloquia: Why are insects small? Aka Why can’t Mothra eat Glendale?

 Hamilton College workshop on the Scaling of Defenses. Why does aerobic metabolic rate scale hypometrically?

 International Union for the Study of Social Insects symposium on Social Insect Ecophysiology: Effects of body size and air temperature on the flight physiology of stingless bees.

 Roy Weber symposium, Sandbjerg, Denmark. Why does aerobic metabolic rate scale hypometrically?

2017 Colloquia: Fakultät für Mathematik, Informatik und Naturwissenschaften, Universität Hamburg. “Do performance-safety trade-offs cause hypometric scaling of metabolic rate?”

 Kjell Johansen Lecture, Aarhus University, Aarhus, Denmark.

“Comparative physiology of insect tracheal systems”

2016 Spirit of the Hive Symposium, Tempe, AZ. Invited speaker. “Size-biased adaptations of ATP demand, not supply, cause hypometric scaling of energy use in metazoans”

International Congress of Entomology, Orlando, FL. Invited speaker for symposium on “The Limits of Respiratory Function: External and Internal Constraints on the Insect Gas Exchange”

 The Krogh Lecture (Plenary). Experimental Biology, San Diego, CA.

2015 Society for Integrative and Comparative Biology, West Palm Beach, FL.

 Invited speaker for symposium “Breaking boundaries for evolutionary synthesis: An interactive and integrative symposium linking crustacean and insect physiology”

 Colloquia: Dept. of Zoology, Univ. of British Columbia

 Colloquia: US Arid Lands Agricultural Research Center, Maricopa, AZ

 Colloquia: Max Planck Institute for Biology of Aging, Cologne, Germany

2014 The International Union for the Study of Social Insects: International Congress, Cairns, Australia.

 Invited speaker for symposium on “Integrative Analyses of Division of

Labor”

 Colloquia: Institute of Zoology, Chinese Academy of Sciences, Beijing

 Invited symposium speaker, Dept. of Biology, Langzhou University, China

 Colloquia: School of Mathematical and Natural Sciences, ASU West

2013 Colloquia: Midwestern University, Dept. of Physiology

 Invited speaker: Arizona Physiological Society

 Colloquia: Texas A&M University, Dept. of Entomology

2012 Entomological Society of America, Knoxville, TN

 Invited speaker for symposium “Global patterns of insect morphometrics”

 Entomological Society of America. Knoxville, TN. Invited speaker for symposium on “Foraging, energetics and life history-the grand connection”

 International Congress of Entomology, Daegu, Korea

 Invited speaker for symposium “Mechanisms of regulation of growth, size and shape in insects”

 Colloquia: Dept. of Engineering Science, Virginia Tech

2011 International Hypoxia Symposium, Lake Louise, Canada. Invited speaker

 Cornell University, Patton Lecture

 Colloquia: Colorado State University, Department of Biology

2010 Colloquia: University of California, Riverside, Department of Biology

 Colloquia: University of Montana, Missoula, Department of Biology

 APS Intersociety Meeting, Westminster, CO

 Invited speaker for symposium “Environmental adaptations of respiratory systems”

2009 SICB, Boston, MA.

 Invited speaker for symposium “Insect evolution”

 Colloquia: Chinese Academy of Sciences, Beijing

 Western Physiological Ecology meeting, Bishop, CA

 Plenary Speaker

 Colloquia: Virginia Polytechnic University

 Department of Engineering Science and Biomechanics

2008 Argonne National Laboratory

 Invited speaker for Argonne User’s Week Science Symposium

 Colloquia: Brown University, Providence, RI

 Department of Ecology and Evolutionary Biology

 Colloquia: University of Arizona State University

 Department of Entomology

 Colloquia: University of New Mexico, Albuquerque, NM Department of Biology

 Colloquia: University of San Diego, San Diego, CA Dept. of Biology

2007 Geological Society of American, Denver, CO

 Invited speaker for symposium “Phanerozoic oxygen”

2006 Society for Integrative and Comparative Biology, Orlando, FL

 Invited speaker for the symposium “Ecophysiology and conservation: the contribution of energetics”

2005 Earth Systems Processes 2, Calgary, Alberta

 Invited speaker for symposium “Phanerozoic O2: Animals, plants and fires”

Colloquia: University of Arizona Department of Entomology

2004 The Abbey, Fontana, WI

 Organized by Argonne National Laboratories

 Invited speaker for workshop “Emerging scientific opportunities using xray imaging”

 Wuerzburg, Germany

 Invited speaker for workshop “Sociocomplexity and genomics in social insects”

 International Congress of Entomology, Brisbane, Australia

 Invited speaker for symposium “Oxygen, water and oxygen radicals in insects: Understanding the balance”

 Society for Integrative and Comparative Biology, New Orleans, LA

 Invited speaker for symposium “Ontogeny of physiological regulatory mechanisms”

Colloquia: University of Nevada, Las Vegas Department of Biology

2003 Colloquia: University of Nebraska

 Department of Biology

Colloquia: University of North Texas

 U Department of Biology

 Colloquia: University of Arizona

 Department of Entomology

 Sixth International Congress of Comparative Physiology and Biochemistry, Mt. Buller, Australia

 Invited speaker for symposium “Physiological gas exchange: strategies for tracheal systems”

2002 Society for Integrative and Comparative Biology, Toronto, Canada.

 Invited speaker for symposium entitled “Biological stoichiometry from genes to ecosystems”

 Comparative Developmental Physiology Workshop, Glen Rose, TX.

Greenlee, K. and J.F. Harrison.

 Ontogeny of the hypoxia response in insects

 Colloquia: Dept. of Animal Physiology, Universitat Humboldt, Berlin

2001 University of Würtzburg

 Department Zoologie

Center for Insect Science Hexapodium Plenary Presentation

 Society for Experimental Biology, Canturbury, U.K

 Invited speaker for symposium "Locomotion and energetics of animals"

 Colloquia: University of California, Riverside

 Department of Entomology

 American Physiological Society, San Diego

 Invited speaker for symposium "Teaching physiology in the 21st century”

2000 Society for Integrative and Comparative Biology

Invited speaker for symposium "Epithelial transport in insects"

International Congress of Entomology, Iguazzu Falls, Brazil Invited speaker for symposium “Insect flight”

International Congress of Entomology, Iguazzu Falls, Brazil

Invited speaker for symposium “Spiracular mechanisms: Ultrastructure and physiology”

1999 Arizona State University, West

 Dept. of Life Sciences

1998 University of Kansas

 Department of Entomology

 University of Arizona

Department of Ecology and Evolutionary Biology

1997 University of Arizona

 Department of Entomology

 Penn State University

 Department of Biology

 Ohio University

 Department of Biology

1996 University of New Mexico, Albuquerque NM

 Department of Biology

 University of California, Irvine

 Department of Ecology and Evolutionary Biology

 Society for Integrative and Comparative Biology, Albuquerque, NM

 Invited speaker for symposium “Responses of terrestrial invertebrates to variation in temperature and water availability: molecular, organismal and evolutionary approaches”

1995 Comparative Section, American Physiological Society, Experimental Biology, Atlanta, GA.

 The "Scholander Lecture"

 American Society of Zoologists, Washington, DC

 Invited speaker for symposium "Comparative aspects of control of arterial blood gases: Ventilatory and cardiovascular perspectives"

1994 USDA W-180 African Honeybee Conference, Tucson, AZ

1993 University of Montana, Missoula, MT

1992 University of Arizona School of Medicine, Department of Physiology

 Dartmouth College Hanover, NH

American Society of Zoologists, Vancouver, B.C.

Invited speaker for symposium “Insect acid-base regulation”

1991 Center for Insect Science, Tucson, AZ

1990 Arizona State University, Tempe, AZ

 San Diego State University, San Diego, CA

 Cleveland State University, Cleveland, OH

1989 University of Utah, Salt Lake City, UT

 University of North Carolina, Charlotte, NC

1988 University of British Columbia, Vancouver, BC1987

 Colorado State University, Fort Collins, CO

 University of California, Irvine, CA

 University of British Columbia, Vancouver, BC

 Wright State University, School of Medicine, Dayton, OH

# MEETING PRESENTATIONS (316 TOTAL; most recent three years shown)

2024 American Physiological Society Summit, Long Beach, CA. C. Perl, J. Haas, R. Johnson, J.R. Glass and J.F. Harrison. Tissue dependence of resting metabolic rate in harvester ants.

Society for Integrative and Comparative Biology, Seattle, WA. Harrison, J.F.C. Perl, R. Johnson, J. Haas, M. Johnson and L. Graber. Affect of body size and social complexity on body and brain metabolic rates of *Pogonomyrmex* ants.

 Society for Integrative and Comparative Biology, Seattle, WA. Talal, S., J.F. Harrison, R. Farrington, J. Youngblood, H. Medina, R. Overson and A.J. Cease. Body mass and growth rates predict protein intake across animals.

 Society for Integrative and Comparative Biology, Seattle, WA. Talal, S., G. Osgood, P. Pulver, J. F. Harrison, and A. J. Cease. Daily consumption is not sufficient to fuel energy for repeated days of locust flight.

 Society for Integrative and Comparative Biology, Seattle, WA. Glass, J.R., N.P. Burnett, S.A. Combes, E. Weisman, A. Helbing and J.F. Harrison. Hot bees adjust wing kinematics to conserve water and improve heat tolerance when lifting loads.

2023 Society for Integrative and Comparative Biology, Austin, TX. M. Johnson and J.F. Harrison. Which abiotic factor limits the flight activity of the Sonoran desert digger bee?

 Society for Integrative and Comparative Biology, Austin, TX. A.L. Fisher II, J.R. Glass, N. Desjardines, C. Ozturk, Y.P. Raka, K. Chahal, G. DeGrandiHoffman, B.H. Smith, J.H. Fewell and J.F. Harrison. The impact of a widely used fungicide on honey bee (*Apis mellifera*) health.

 Society for Integrative and Comparative Biology, Austin, TX. Glass, J.R. and J.F. Harrison. Hot bees lift loads without warming or increasing metabolic rate.

 Society for Integrative and Comparative Biology, Austin, TX. Raka, Y.P., T. Fox and J.F. Harrison. Mesocosm approach to understanding the poleward expansion of the Zika-carrying *Aedes aegypti*.

 Society for Integrative and Comparative Biology, Austin, TX. Pearl, C., J.F. Haas and J.F. Harrison. Causal mechanisms for variation in resting metabolic rates.

 Entomological Society of America, Washington DC. Glass, J.R., N.P. Burnett, S.A. Combes, E. Weisman, A. Helbing and J.F. Harrison. Hot bees adjust wing kinematics to conserve water and improve heat tolerance when lifting loads.

2022 Entomological Socity of America, Vancouver, B.C. Cease, A, S. Talal, C.

Aunmolpreet, G. Osgood, J. Brosemann, S. Millerwise and J.F. Harrison. Generalist insect herbivore regulates carbohydrate and lipid intake to increase the efficiency of migratory fuel accumulation.

 Entomological Socity of America, Vancouver, B.C. Glass, J.R. and J.F. Harrison. Predicting the effects of heat waves on honey bee foraging.

 Entomological Society of America, Vancouver, B.C. Millerwise, S., S. Talal, P. Pulver, E. Goethe, G. Osgood, R. Overson, E. Cossey and J.F. Harrison. Dietary macronutrient balance affects reproductive performance across locust lifespans.

 Entomological Society of America, Vancouver, B.C. Desjardines, N., A. Fisher, J.F. Harrison and B.H. Smith. Fungicide exposure reduces learning performance and homing ability in honey bees (*Apis mellifera*).

Entomological Society of America, Vancouver, B.C. J.H. Fewell, X. Guo, C. Lynch, M. Ostwald and J.F. Harrison. Metabolic scaling and early colony growth in harvester ants.

 Entomological Society of America, Vancouver, B.C. J.F. Harrison, A.L. FisherII, M.R. Berenbaum, J.D. Crall, J.C. Nieh, H. Siviter, R. Tadei, F. Muth, L.H. Liao and J.R. Glass. Breaking the cycle: reforming pesticide reguations to protect pollinators.

 Entomological Society of America, Vancouver, B.C. Fisher, A.L. II, J.R.

Glass, N.S. Desjardines, C. Ozturk, G. DeGrandi-Hoffman, B.H. Smith, J.H. Fewell and J.F. Harrison. The impact of a widely used fungicide on honey bee (*Apis mellifera*) health.

 Comparative Physiology: From Organisms to Omics in an Uncertain World. San Diego, CA. Pearl, C. and J.F. Harrison. Causal mechanisms of variation in resting metabolic rate.

 Comparative Physiology: From Organisms to Omics in an Uncertain World. San Diego, CA. Glass, J.R. and J.F. Harrison. Evaporative cooling and increased load-lifting efficiency allows nectar-foraging honey bees to break the thermal performance curve barrier.

 Comparative Physiology: From Organisms to Omics in an Uncertain World. San Diego, CA. Johnson, M., J.R. Glass and J.F. Harrison. Is heat or desiccation the major challenge for small desert animals?

 Comparative Physiology: From Organisms to Omics in an Uncertain World.

San Diego, CA. Harrison, J.F., T. Fox, Y. Raka and J.J. Socha. Unidirectional airflow can rapidly flush the tracheal system of the darkling beetle, *Zophobas morio*.

 9th International Symposium on the Environmental Physiology of Ectotherm and Plants, Rennes, France. Glass, J.R. and J.F. Harrison. Evaporative cooling and reducing heat production allows honey bees to beat the heat when nectar foraging.

International Union for the Study of Social Insects meeting, San Diego.

Harrison, J.F., Gou, X, Ostwald, M., Clark, R., Fox, T., Waters, J. and J.H. Fewell. Behavioral and physiological mechanisms for economies of scale in ant colonies.

 International Union for the Study of Social Insects meeting, San Diego.

Glass, J.R. and J.F. Harrison. Evaporative cooling and reducing heat production allow honey bees to beat the heat when nectar foraging.

 International Union for the Study of Social Insects meeting, San Diego. Johnson, M.D. and J.F. Harrison. The natural air conditioning of a desert bee in a changing climate.

 International Union for the Study of Social Insects meeting, San Diego.

Desjardines, N.S, Ozturk, C., Fisher, A. III, Harrison, J.F. and B.H. Smith. Fungicide exposure reduces learning performance and homing ability in honey bees.

 International Union for the Study of Social Insects meeting, San Diego. Fisher, A. II, Ozturk, C., Smith, B.H., Fewell, J.H. and J.F. Harrison. A widely used mito-toxic fungicide affects honey bee (*Apis mellifera*) hemolymph protein levels and ontogeny.

 International Union for the Study of Social Insects meeting, San Diego. Perl, C. and J.F. Harrison. Social complexity and brain metabolic rate of harvester ants.

Society for Integrative and Comparative Biology. Phoenix, AZ. Glass, J.R. and J.F. Harrison. Effects of air temperature and pesticides on the maximal flight capacities of the honey bee, *Apis mellifera*.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Millerwise, S.M., Talal, S., Harrison, J.F., Eapen, C. and A. Cease. The effect of macronutrient consumption on reproductive performance in locusts.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Osgood, G.M., Talal, S., Millerwise, S., Overson, R., Harrison, J.F. and A. Cease. Migratory locusts increase carbohydrate but not protein consumption during simulated migration.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Harrison, J.F. and M.E. Duell. Introduction to the symposium: causal mechanisms of metabolic scaling.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Duell, M.

and J.F. Harrison. The role of body size and temperature in flight metabolic rate scaling among flying insects.

Society for Integrative and Comparative Biology. Phoenix, AZ. Coto, Z.,

Muratore, I., Fandozzi, E., Azorsa, F., Waters, J., Harrison, J.F., Perl, C., Kamhi, J.F., Muscedere, M. and J.F.A. Traniello. Body size, social complexity and brain metabolic scaling in ants.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Somjee, U.S., Powell, E.C., Harrison, J.F., Hickey, A.J. and C. Painting. The metabolic costs of exaggerated sexually selected traits.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Raka, Y., Fisher, A., DeGrandi-Hoffman, G., Ozurk, C., Smith, B., Fewell, J. and J.F. Harrison. The effect of a widely-used mitotoxic fungicide on colony growth in honey bees.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Parmar, S., Talal, S., Overson, R., Harrison, J.F. and A. Cease. Effect of macronutrients on migratory locust (*Locusta migratoria*) flight performance.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Desjardines, N.S., Fisher, A., Harrison, J.F. and B.H. Smith. The effects of a common agricultural fungicide on homing ability in honey bees (*Apis mellifera*).

 Society for Integrative and Comparative Biology. Phoenix, AZ. Fisher II,

A., Ozturk, C., Glass, J.R., Desjardines, N., DeGrandi-Hoffman, G., Smith, B.H., Fewell, J.H. and J.F. Harrison. Seasonal variability in physiology and behavior affect the impact of fungicide exposure on honey bee (*Apis mellifera*) health.

 Society for Integrative and Comparative Biology. Phoenix, AZ. Johnson, M., Glass, J.R., Alvarez, K. and J.F. Harrison. How to fly at highly variable temperatures when your genes depend on it.

# CLASSROOM AND ONLINE TEACHING

|  |  |
| --- | --- |
| 2023, Fall2023, Spring   |  Online Bio 360 (Animal Physiology, 3 credits, enrollment 245)Online Bio 361 (Animal Physiology Lab, 2 credits, enrollment 118)Bio 498/591, Insect Physiology, enrollment 14  |
| 2022, Fall  | Online Bio 360 (Animal Physiology, 3 credits, enrollment 222)  |
|    | Online Bio 361 (Animal Physiology Lab, 2 credits, enrollment 99)  |
| 2022, Spring   | Excused from teaching due to double-load in Fall, 2021  |
| 2021, Fall  | Bio 360 (Animal Physiology, 3 credits, enrollment 260)  |
|    | ANB 602 (Animal Behavior graduate seminar, 1 credit, enrollment 7, co-taught with Brian Smith)  |
| 2021, Spring   | Online Bio 360 (Animal Physiology, 3 credits, enrollment 160) and Online Bio 361 (Animal Physiology lab, 2 credits, enrollment 100)  |
| 2020, Fall  | Bio 591, Insect Physiology (3 credits, enrollment 11)  |
| 2020, Summer  |  Online Bio 361, Animal Physiology Lab, 2 credits, enrollment 90  |
| 2020, Spring   | Online Bio 360 (Animal Physiology, 3 credits, enrollment 150) and Online Bio 361 (Animal Physiology lab, 2 credits, enrollment 100)  |
| 2019, Fall   | Online Bio 360, Animal Physiology, 3 credits, enrollment 94  |
| 2019, Spring  | Online Bio 360, Animal Physiology, 3 credits, enrollment 73  |
| 2019, Summer |  Online Bio 361, Animal Physiology Lab, 2 credits, enrollment 90  |
|    | Bio 494, Tropical Biology in Panama, 4 credits, enrollment 15  |
| 2018   | Developed online Bio 360, Animal Physiology, 3 credits, and online Bio 361, Animal Physiology Lab, 2 credits for rollout in 2019.  |
| 2018, Fall  | Bio 494, Insect Physiology, 3 credits, enrollment 10  |
|  2018, Summer Bio 494, Tropical Biology in Panama, 4 credits, enrollment 8  2017, Fall Bio 385, Invertebrate Zoology, 4 credits, enrollment 46  Bio 602, Current Issues in Behavior, 1 credit, enrollment 4  Bio 189, Mentor Seminar, recitation, enrollment 19  2017, Spring Bio 360, Animal Physiology, 3 credits, enrollment 234  Bio 361, Animal Physiology lab, 2 credits, enrollment 64  |

Bio 394, Honor’s section for Bio 360, 1 credit, enrollment 16

2016, Spring Bio 385, Invertebrate Zoology, 4 credits (with lab), enrollment 68

2016, Summer Bio 494, Tropical Biology in Panama, 6 credits, enrollment 12

2015, Fall Bio 460 – Comparative Physiology, enrollment 77

 Bio 591 – Insect Physiology, enrollment 10

 Bio 189 – Life Science Career Paths, enrollment 20

2015, Summer Bio 494, Tropical Biology in Panama, enrollment 16

2014, Fall Bio 460 Comparative Physiology, enrollment 32

 Bio 591, Environmental Life Sciences, enrollment 7

2014, Spring Bio 460 – Comparative Physiology, enrollment 30

 Bio 591-Seminar in Evolutionary Physiology, enrollment 12

2013, Fall Bio 591 – Insect Physiology, enrollment 10

2012, Fall ANB 602 -Animal Behavior Seminar, enrollment 9

2011, Fall Biology 189 - Life Science Career Paths, enrollment 17

2010, Fall Biology 461 - Comparative Animal Physiology, enrollment 34

200l, Spring Biology 181 - General Biology (with J. Wilson-Rawls)

 Approximate Enrollment 380 (supervised 8 TAs)

2008, Fall Biology 202 - Human Anatomy and Physiology

 Approximate Enrollment 280 (supervised 7 TA’s)

2008, Fall Biology 591 - Seminar in Environmental Life Sciences

 Enrollment 20

2007, Fall Biology 361 - Animal Physiology Lab

 Approximate enrollment 32, supervised 2 TA’s

2006, Spring Bio 591 - Seminar in Ecological/Evolutionary Physiology of Insects enrollment 8

2006, Fall Biology 560 -Comparative Animal Physiology, enrollment 8

 Biology 360 - Animal Physiology

Approximate enrollment 170

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| --- | --- |
| 2005, Spring | Biology 360 - Animal Physiology, enrollment 100  |
|   | Bio 361 - Animal Physiology Lab: enrollment 64  |
|    | Bio 591 - Seminar in Insect Physiology: enrollment 9  |
| 2004, Spring  | Bio 360 - Animal Physiology, enrollment 160  |
|    | Bio 361 - Animal Physiology Lab, enrollment 32 (supervised 2 TA’s)  |
| 2004, Fall  | Bio 591 - Oxygen Radicals and Oxidative Stress, enrollment 7  |
| 2003, Spring  | Bio 188 - General Biology (with J. Wilson-Rawls)  |
|   | Approximate enrollment 350 (supervised 8 TAs)  |
| 2003, Fall   | Bio 560 - Comparative Physiology, enrollment 13  |
| 2002, Spring  | Bio 360 - Animal Physiology, enrollment: 112  |
|   | Bio 494 - Writing Seminar for Beckman Fellows  |
|   | Enrollment 6  |
| 2001, Fall  | Bio 360 - Animal Physiology (with M. Moore)  |
|   | Approximate enrollment: 70 (supervised 4 TAs)  |
| 2001, Fall  | Bio 591 - Seminar in Comparative Animal Physiology  |
|   | Enrollment: 6  |
| 2000, Spring  | Bio 182 - General Biology (with Dr. Fewell)  |
|   | Approximate enrollment: 250 (supervised 5 TAs)  |
| 2000, Spring  | Bio 598 - Cellular and Organismal Responses to Stress  |
|   | (with Drs. Orchinik and Deviche)  |
|   | Approximate enrollment: 12  |
| 2000, Fall  | Bio 201 - Human Anatomy & Physiology (with R. Satterlie)  |
|    | Approximate enrollment: 150, supervised 3 TAs  |
| 1999, Spring  | Biology 182 - General Biology (co-taught with J. Fewell)  |
|   | Approximate enrollment: 250 (supervised 6 TAs)  |
|   | Zoology 591 - Seminar in Animal Design and Function  |
| 1999, Fall  | Bio 360 - Animal Physiology  |
|   | Approximate enrollment: 120 (supervised 4 TAs)  |
|   | Bio 591 - Seminar in Biochemical Adaptation  |

Bio 591 - Seminar in Animal Design and Function

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| --- | --- |
| 1998, Spring | Zoology 598 - Comparative and Environmental Physiology  |
|   | (co-taught with G. Walsberg)  |
|   | Approximate enrollment: 10  |
|   | Zoology 591 - Seminar in Animal Design and Function  |
| 1998, Fall  | Biology 360 - Basic Physiology  |
|   | Approximate enrollment: 120 (supervised 4 TAs)  |
|   | Zoology 591 - Seminar in Animal Design and Function  |
| 1997, Spring  | Zoology 560 -Comparative Physiology  |
|   | Approximate enrollment: 12  |
| 1997, Fall  | Zoology 202 - Human Anatomy and Physiology  |
|   | Approximate enrollment: 150 (supervised 3 TAs)  |
|   | Zoology 494 - Advanced Human Anatomy and Physiology  |
|   | Zoology 591 - Seminar in Organismal Biology (with J. Fewell)  |
| 1996, Fall  | Zoology 202 - Human Anatomy and Physiology  |
|   | Zoology 494 - Advanced Human Anatomy and Physiology  |
| 1995, Fall  | Zoology 360 - General Physiology  |
|   | Zoology 591 - General Principles and Current Topics  |
|    | in Insect Physiology  |
| 1994, Spring  | Zoology 202 - Human Anatomy and Physiology  |
|   | Zoology 494 - Advanced Human Anatomy and Physiology  |
| 1994, Fall  | Zoology 560 - Comparative Physiology  |
| 1993, Spring  | Zoology 202 - Human Anatomy and Physiology  |
|   | Zoology 494 - Advanced Human Anatomy and Physiology  |
| 1993, Fall  | Zoology 202 - Human Anatomy and Physiology  |
|   | Zoology 494 - Advanced Human Anatomy and Physiology  |

Seminar: Zoology 591 - Elements in Individuals and Ecosystems

1992, Spring Zoology 202 - Human Anatomy and Physiology

1992, Summer Zoology 202 - Human Anatomy and Physiology

1992, Fall Zoology 560 - Comparative Physiology

 Zoology 494 - Advanced Human Anatomy and Physiology

1991, Spring Zoology 202 - Human Anatomy and Physiology

1991, Summer Zoology 202 - Human Anatomy and Physiology

# DEPARTMENT AND UNIVERSITY SERVICES

2023 – 2024 Chair, SOLS Academic Program Review Committee

 Member, SOLS Undergraduate Program Committee

 Member, ASU Instrument Design and Fabrication Committee

 Member, Search Committee for the Director of the School of Applied Sciences and Arts

2022–2023 Chair, STRI-ASU Initiative

 Member, SOLS Undergraduate Program Committee

 Member, ASU Instrument Design and Fabrication Governance Committee

 Member, Search committee for the Director of the School of Applied

Sciences and Arts

 Member, ASU’s Higher Learning Commission Institutional

Accreditation Committee

2021 -2022 Substitute CLAS Associate Dean for Facilities (2 months)

 Chair, STRI-ASU Initiative

 Member, SOLS Undergraduate Program Committee

 Chair, Physiology Instructor Search Committee

 Chair, Physiology Lecturer Search Committee

2020-2021 Chair, Physiology Instructor Search Committee

 Co-chair, NACE Competencies Mapping Committee

 Chair, STRI-ASU Initiative

 Member, SOLS Biology Graduate Program Committee

 Member, SOLS Undergraduate Program Committee

 Member, SOLS Education Retreat Planning Committee

 Member, Medical Biosciences M.Sc. Degree Committee

2019-2020 Co-Chair, Inclusive Biology Education Faculty Search

 Chair, STRI-ASU Initiative

 Member, SOLS Biology Graduate Program Committee

 Member, SOLS Undergraduate Programs Committee

 Member, SOLS BioCore Committee

2018-19 Chair, STRI-ASU Initiative

 Member, SOLS Undergraduate Programs Committee

 Member, SOLS Biospine Committee

2017-18 SOLS Director Search Committee

 University Research and Creative Activities Committee

 University Faculty Mentoring Award Selection Committee

2015-18 Chair, ASU-STRI Cooperative Initiative

 Biology graduate program committee

2015-16 ASU Research and Creative Activities committee

2014-15 Chair, Search Committee for SOLS Director

 SOLS Research and Training Initiative Committee

 Biology graduate program committee

2011-2013 Director of Research Facilities and Infrastructure, Office of

Knowledge Enterprise Development, ASU (75% appointment)

 Assistant Vice-President for Research, Office of Knowledge

 Enterprise Development (OKED, 75% appointment)

 Institutional Official for Animal Care

 Co-Chair of EH&S Policy Committee

 Research Integrity Officer

 Faculty Participant, Federal Demonstration Project

2010-2011 Director of Research Facilities and Infrastructure, Office of

Knowledge Enterprise Development, ASU (50% appointment)

2009-2010 Sabbatical

2008-2009 Associate Director for Facilities, School of Life Sciences

Safety committee (member, supervisor)

Insect Science Center Executive Committee

Organizing Committee, Environmental Life Sciences Ph.D. program

2007-2008 Associate Director for Facilities, School of Life Sciences

Safety committee (member)

Insect Science Center Executive Committee

2006-2007 Associate Director for Facilities, School of Life Sciences

Safety Committee (chair during fall, 2006, member in spring 07)

Chair, Graduate Programs Associate Director Search Committee

Insect Science Center Executive Committee

2005-2006 Associate Director for Facilities, School of Life Sciences

 Safety Committee (ex-officio)

 AP Personnel committee

 Physiology Curriculum Committee

 Insect Science Center Executive Committee

2004-2005 Insect Science Center Executive Committee

 Initiative Programs Committee Member, elected

 Chair, Honey Bee Reproductive Physiology Search Committee

 ISTB-1 Ad Hoc Building Committee

 OISB Hiring Proposal Ad-Hoc Committee

2003-2004 Insect Science Center Executive Committee

 Initiative Programs Committee Member

 Elected Evolutionary and Systems Biology committee Member

SOLS Director Search Committee Member

Elected, Affirmative Action Officer

Physiology Lecturer Search Committee Member

2002-2003 Sabbatical

 Exercise Science Executive Committee

 Insect Science Center Executive Committee

Chair, Search Committee for Anatomy and Physiology Lab Coordinator

2001-2002 Chair, Search Committee for Director of Interdisciplinary Ph.D.

 Program in Exercise Science

 Exercise Science Executive Committee

 Insect Science Center Executive Committee

 Chair, Beckman Scholar Steering Committee

 Life Sciences Reorganization Committee

2000-2001 Advisory Committee (elected)

 Graduate Committee

 Exercise Science Executive Committee

 Insect Science Center Executive Committee

 Wrote Beckman Foundation grant for undergraduate research

 Chair, Beckman Scholar Steering Committee

1999-2000 Advisory Committee (elected)

 Exercise Science Executive Committee

 Insect Science Center Executive Committee

 Chair, Biology Department Seminar Committee

 wrote Beckman Foundation grant for undergraduate research

1998-99 Personnel Committee (elected)

 Exercise Science Executive Committee

 wrote Beckman Foundation grant for undergraduate research

 (grant declined)

1997-1998 Chair, Search Committee, Environmental or Evolutionary

 Physiologist

 Advisory Committee (elected)

1996-1997 Advisory Committee (elected)

 Graduate Committee

1995-1996 Advisory Committee (elected)

 Graduate Committee

 Search Committee, Theoretical Ecologist (affirmative action officer)

1994-1995 Advisory Committee (elected)

 Graduate Committee

 Search Committee, Integrative Biologist (affirmative action officer)

1993-1994 Advisory Committee (elected)

 Graduate Committee

1992-1993 Advisory Committee (elected)

 Graduate Committee

 Organizer: Physiology Discussion Group, Spring 1992

1991 Co-Chair, Seminar Committee

# MENTORING

**Past Postdoctoral Fellows (from most recent to earliest):**

Craig Perl (Ph.D. 2018, University of Sussex, currently Postdoctoral Research Fellow, Dept. of Biology, Indiana University Indianapolis and Visiting Researcher, Institute of Aquaculture, University of Stirling)

Adrian Fisher, II. (Ph.D. 2017, Texas A&M University, currently Assistant Professor, School of Life Sciences, Arizona State University).

Megan Garlapow (Ph.D., 2015, North Carolina State University, currently Principal and Owner, The Line Medical Communications, LLC).

C. Jaco Klok (Ph.D., 1999, University of Pretoria). Currently Senior Research and Applications Scientists at Sable Systems International.

Viviane Callier, Ph.D. 2011, Duke University, currently biostatistician at the Biostatistics Research Branch, NIAID (NIH).

John VandenBrooks, Ph.D. 2006, Yale University, currently Professor at Arizona State University.

H. Arthur Woods, Ph.D., 1998, Univ. of Washington, Emeritus Professor, Univ.

of Montana, Missoula.

Patricia Ashby, Ph.D. 1987, Univ. of New Mexico, currently Associate Professor, Scottsdale Community College (Summer 1997)

**Current Postdoctoral Fellows:**

Stav Talal. (Ph.D. 2018.Tel Aviv University, BARD fellowship).

**Matriculated Graduate Students:**

Nicole Desjardins, Ph.D. May 2023 (co-advised with Brian Smith). Currently NSF Postdoctoral Fellow at the Univ. of Wisconsin.

Meredith Johnson, Ph.D. August 2023. Currently postdoctoral fellow at North Dakota State University.

Jordan Glass, Ph.D. May 2023. Currently postdoctoral fellow at University of Wyoming.

Trevor Fox, Ph.D. May 2021. Environmental Scientist, Sacramento-San Joaquin Delta Conservancy (State of California)

Jacob Campbell, Ph.D. August 2018. Currently Scientist, Global R&D, mRNA Development for Aldevron Inc.

Meghan Duell, Ph.D. December 2018. Program manager, Couchiching Conservancy, Ontario, Canada.

James Sargent, M.Sc. May 2019. Research Scientist, 28Gorilla, Chandler, AZ.

Arianne Cease, Ph.D. May 2012, NSF DDEP award, postdoctoral fellowship at the University of Sidney, currently Associate Professor, School of Sustainability, ASU (Popular Science Brilliant 10, 2015)

James S. Waters, Ph.D. Dec., 2012, NSF, Predoctoral Fellowship Award, NSF Doctoral Dissertation Improvement Grant, James S. McDonnell

Postdoctoral Fellow in Complexity Science at Princeton University; currently Associate Professor at Providence College.

Joanna Henry, M.Sc. August 2011, currently lab coordinator, School of Life Sciences, ASU.

Manoush Farzin, M.Sc. 2010, DDS from Midwestern University School of Dentistry, Chicago, 2018.

Sydella Blatch, Ph.D. May 2008, NSF Predoctoral Award, PDF at NIH, Bethesda; Program Director, National Institutes of Health.

Brenda Rascón, M.Sc. Dec. 2007, Regulatory Affairs Manager, Cinfa Biotech, Biosimilars.

Kendra Greenlee, Ph.D. May 2004, NSF Doctoral Dissertation Improvement Grant, EPA Star Award, currently Professor, North Dakota State, Fargo.

Scott Kirkton, Ph.D. May 2004, NSF Doctoral Dissertation Improvement Grant, Best Student Paper, Society for Experimental Biology 2002, Best

Student Paper, SICB 2003; NIH PDF at Scripps Research Institute, San

Diego, currently Associate Professor, Union College

Marc Perkins, M.Sc. 2001, currently Professor, Orange County Community College

Melanie Frazier, M.Sc. 2000, Staff Scientist at the National Center for Ecological Analysis and Synthesis (Ocean Health Index), Santa Barbara, CA.

Steven Roberts, Ph.D. May, 1998, Outstanding Graduate of the College of Liberal Arts and Sciences, currently Vice-Provost, Dean and Professor, Missouri University of Science and Technology, Rolla.

**Current Ph.D. Students**:

Mehreen Tahir (co-advised with Arianne Cease), Sydney Millerwise (co-advised with Arianne Cease)

**Graduate Committee Service**: Student in the Dept. of Zoology/Biology or School of Life Sciences, Arizona State University unless otherwise indicated:

**Past (63 total):**

Khalid Adjerid (Virginia Tech), Kirk Anderson, Salvatore Anzaldo, Patricia

Ashby (Univ. of New Mexico), Susan Bertram, Ioulea Bespalova, Jason

Borchert, Andrew Burchill, Jake Brashears, Chris Breitmeyer, Michael Bizeau,

Michael Black, Christina Burden, Rebecca Clark, Michael Crowley (Exercise

Science), Courtney Currier, Dean R. Dobberfuhl, Jennifer Edmonds, G. Ian

Gallicano, Martin Gerrits, Josh Gibson, Chris Goforth (Univ. Arizona), Ti

Eriksson, Dina Grayson, Tamar Helmy, Ty Hoffman, Carter Holbrook, Richard

Howlett (Exercise Science), Kate Ihle, Matt Jackman (Exercise Science), Andrew Janzen, Chris Jerrnigan, Glennis Julian, Michael Kennedy, Rosemary Knapp,

Sarah Kuzmiak, Eva Lacy, Israel Leinbach, Marion Le Gall (Texas A&M), Nikos Lessios, Neil Mackay, James Maino (Univ. Melbourne), Chris Mallery (Univ.

North Texas), Devin Martin, Susan McKinley, Natalie Melkonoff, Justin Merry,

Este Miranda, Lee McCoy, Nathan Morehouse, John Olson (Utah State Univ.), Madeleine Ostwald, Christina Palmrose-Kreiger, Dale Pasino, Randi Papke, John Robertson, Michael

Quinlan, Darleen Sandoval (Exercise Science), Nathan Smith, Zachary Stahlschmidt, Randy Tracy, Tina Traustidottir (Exercise Science), James Watts, Todd Weaver, Todd McWhorter (Univ. of Arizona), Adrienne Williams (Univ. of California, Irvine), Blair Wolf, Mark Wooden, Christian Wright, Mathew Sara

Wilmsen (Univ North Texas), Wright, Guo Xiao, Kasey Yturralde, John Zehmer, Deanna Zembruski

**Current graduate committee service:**

Zach Coto (Boston Univ.), Brook Jensen, Joshua Kalmouni, Colin Lynch, Tyler

Murdock, Brian Reilly, Sebastian Scofield, Emily (Jordan) Smith (Boston Univ), Bogoljub Trickovic, Donald Ward

**Undergraduate Researchers Supervised:**

**Past:**

Christopher Abdo (currently in medical school, U. of A, Phoenix)

Sufian Ahmed

Todd Albert (currently staff at ASU)

Diana Almendarez (WAESO-funded)

Vahan Aivasian

Brandon Balsino (honor’s thesis, currently in medical school)

Aurora Beans

Taylor Biddolph (in Ph.D. program in Pathology)

Layne Bobb

Joshua Borup (in medical school)

Jacque Bruce

Christopher Bowman (switched to Anthropology at ASU)

Alexandra Brantley (currently research technician, UC Denver)

Aaron Bruce (M.D., Midwestern University)

Greg Burnett (M.D. program, Univ. of Arizona)

TimaSue Cantu (Gates Scholar, currently a nurse)

Keerut Chahal (honor’s thesis)

Elise Chester (honor’s thesis)

Jillian Ciarlariello (biotechnician)

Patricia Coulter (unknown)

Kelsey Cooper (currently working as a vet tech)

Margaret Creswell (Ph.D., Univ. Texas, Austin, Biology),

Tyler Davis (working, applying for medical school)

Victoria Depner

Samuel Dierks

Leon Dilly

Seth Dobrin (Ph.D., A.S.U., Microbiology),

Saundra Dohwenrend (Barrett honor’s thesis, currently in Ph.D. program in

Biology at Univ. Washington)

Pirouz Ebadi

Kristina Egbert (unknown)

Jennifer Esman (unknown)

Kyra Espinosa (B.Sc., Bioengineering, A.S.U.)

Ruth Farrington (in Ph.D. program, George Washington Univ)

Erica Feuerbacher (currently in Ph.D. program, Cornell Univ.),

Colleen Ford (B.Sc., working as high school biology teacher)

Maya Fortier

Trevor Fox (Ph.D., ASU, currently staff scientist at San Jaoquin River

Conservation District – State of California))

Melanie Frazier (Ph.D., University of Washington, Project Analyst, Ocean

Health Index, Univ. of California, Santa Barbara)

James Gerace (M.D., DePaul Univ. Medical School),

Nicholas Gonzalez (M.D., Univ. Wisconsin Medical School),

Preyanka Govender

Austin Gil

Alex Gray (currently research assistant, U Colorado, Denver)

John Gransee (B.A. in Psychology from ASU, currently a counselor)

Kendra Greenlee (currently Professor and Chair, North Dakota State)

Joy Gur-Lavi (M.D., Emory Univ. Medical School),

Olivera Grubisha (unknown)

Scotti Gulinson (DVM, Univ. Calif. Veterinary School, Davis),

Runlong Guo (in dental school)

James Haas (honor’s thesis)

Steve Hammet (M.D., Univ. of Arizona)

DeeAnn Hartung, 2000-2002, (Ph.D., 2009, Univ. of California, Santa Barbara, currently biologist Univ. Colorado, Denver)

Erica Heinrich (Assistant Professor, Univ. California, Riverside)

Stephanie Heinrich

Alina Helbling

Joanna Henry (lab coordinator at ASU)

Nicole Holden (Ph.D.,Univ. British Columbia)

Adam House

Alexander Hubb (M.D. and researcher, Univ. of Iowa)

Logan Hunt

Ramzi Ibrahim

Saman Jirjies (M.Sc.,Bioinfomatics, ASU)

Sabrina Jones

Ami Joshi

Dena Kalamchi

Kenyan Kearney

Anna Kuznetsova

Anelia Kassi (M.D., Univ. Miami)

Kenyan Kerman

Alexander Keyel Ph.D., Tufts University)

Jinkyu Kim (M.S.,ASU)

Sakina Kino (B.Sc., Biochemistry degree at ASU, unknown)

Katie Krolikowski (Ph.D., Harvard Univ., Biology, Associate. Professor, Contra

Costa College),

Nemanja Kuzmanovic

Jesse LaFrenier (architect)

Dillon LaMoure

Jessalyn Macias

Kyle Meyer (M.D., Univ OK)

Ben McKinley (M.D. Univ. Minnesota)

Victoria Morgan

Elyse Munoz, (PhD, Biology, Penn State, currently healthcare analyst at IQVIA) Subhiksha Muregesh

Andrew Mussa

Uio Sara Liao (software consultant),

Xu Lui (Ph.D., Purdue Univ., Biochemistry),

Danielle Niren (working as a biochemist)

Ekwutosi Ohuro (M.D., Tufts University)

Choognam Onoe

Paula Overby, lab manager, Dept. of Psychology, ASU

Rekha Nair (unknown)

Christina Nebeker

Elana Niren

Jared Nsika (M.D./Ph.D., U.C., San Diego)

Teja Peela

Nicholas Pierce (technician at Sun Health)

Aunmolcheet Prahal (honor’s thesis)

Catherine Prendergast (Analyst, Congressional Budget Office)

Andrew Rael (biotechnology technician)

Katrina Ramsey (Barrett honor’s thesis, currently in Pharmacy School,

Midwestern Univ.)

Grace Rauch

Brenda Rascon (PhD, Biology, Univ. Norway, currently Senior Consultant,

Biopharma Excellence)

Anam Saed,

Yasir Salih (currently working as a community organizer)

Sophia Sassine

Uri Segal

Hunter Smith

Sean Smith

Daniela Sota

Jennifer Stewart (Ph.D., Colorado State Univ., Immunotoxicologist, SNBL),

Danaira Vasquez

Julian Wagner (in Biology Ph.D. program at Cal Tech)

Michael Weed (staff at ASU)

Ethan Weisman (honor’s thesis)

Lauren Welch, staff scientist, SRP

Simon Werkhoven (West Virginia School of Osteopathic Medicine)

Marcellina Wiertek

Eric Wilkinson (M.D., Stanford Medical School)

**Current Undergraduates in Lab:**

Cody Little, Yash Raka (honor’s thesis), James Haas

**High School Students Mentored in Lab:**

Gabrielle Wightman (2012), Elizabeth Palos (2012), Ruth Farington (2014), Jinoh Lee (2014), Joseph Park (2014), Farin Shiehzadegan (2014, Science Fair prize)

**High School Teacher Mentored in Lab:**

Shoshanna Kroeger (2012)

**ACADEMIC/PROFESSIONAL DEVELOPMENT**

 Sept 2023 RISE Workshop: How can we make evolution education more effective?

 April 2023 Culturally Aware Mentoring

 March 2022 Culturally Aware Mentoring

 March 2018 Mastering Online Teaching

 Feb 2018 Copywrite and Fair Use Webinar for Instructors

 Jan 2018 The Basics of Planning a Successful Online Course

 Nov 2017 CLAS Natural Sciences Teach Online Showcase

 Nov 2017 Shindig Lunch and Learn

 Jan 2013 Federal Demonstration Project, ASU faculty representative

 Jan 2012 Federal Demonstration Project, ASU faculty representative

 Sept 2009 Project Science Management workshop

Summer 2002 General Biology Workshop (1 week)

 Spring 1994 "Fast Plants" teaching workshop by Paul Williams (1 day)

 Summer 1993 Hughes Teaching Strategies Workshop (1 month)

**PRESS COVERAGE/PUBLIC SERVICE/OUTREACH**

2023

Interviewed by Hunter Rhea, ASU State Press re decline of honey bees

Interviewed by Breana Steele for Cronkite News on decline of honey bees

2020

Invited speaker for the Central Arizona Chapter of the Society for Conservation

Biology (Hazards of Agrochemicals for Pollinators)

https://science.kjzz.org/content/1400886/how-grasshoppers-deal-blood-rushing-their-heads https://www.nsf.gov/discoveries/disc\_summ.jsp?cntn\_id=299875&org=NSF&from=news https://www.aps.anl.gov/APS-Science-Highlight/2020-01-15/revealing-insects-physiologicalresponses-to-gravity

https://www.iflscience.com/plants-and-animals/scientists-put-grasshoppers-in-a-linearaccelerator-to-see-what-happens-when-theyre-upside-down/

 https://www.smithsonianmag.com/smart-news/humans-grasshoppers-grapple-gravitys-effectsblood-pressure-180973958/

https://www.roanoke.com/news/education/gravity-affects-insect-blood-flow-like-in-humanssays-study/article\_ca5e77fa-41fa-5d28-a987-459fc1b592a7.html?

https://www.nytimes.com/2020/01/13/science/insects-gravity.html

https://asunow.asu.edu/20200113-asu-researcher-unlocks-mysteries-grasshopperresponse-gravity

https://phys.org/news/2020-01-x-ray-images-reveal-insects-physiological.html

2019

https://asunow.asu.edu/20190503-discoveries-tiny-bee-brains-could-reveal-solutionsminiaturizing-artificial-intelligence

**2017**

KJZZ/NPR interview with Lauren Gilger (The Show)

http://theshow.kjzz.org/content/446430/asu-research-studying-reasons-beepopulation-decline

Arizona Republic coverage of ASU honey bee research (including our lab):

http://www.azcentral.com/story/sponsor-story/arizona-state-university/2017/02/23/asuhoneybee-decline-threat-to-global-food-supply/98301512/

NPR coverage of my lab’s research into the potential role of fungicides on declining pollinators (imminent).

**2016**

Created the Beetle Dissection tool on Ask A Biologist website https://askabiologist.asu.edu/beetle-dissection

This site is a network of 54 high-quality photographic and x-ray images that students can click through to see and identify more than 40 structures in unprecedented detail. The site also includes student activities and teacher guidance materials, and is written in HTML5, and so is compatible with tablets and phones, greatly facilitating studentuse. We worked closely with educators to ensure that the educational goals aligned with Arizona and Common Core standards.

**2015**

Featured on the blog “Noticing” by Robert Krulwich and Aatish Bhatia.

http://noticing.co/how-insects-breathe/

Featured in article in Science on SICB Pancrustacean symposium

(http://www.sciencemagazinedigital.org/sciencemagazine/16\_january\_2015?folio=22 0#pg12).

**2014**

Manduca website on Ask-A-Biologist

(https://askabiologist.asu.edu/experiments/manduca)

This is an educational website, aimed at middle-high school students, designed to teach core principle related to insect development and effects of temperature on growth and size. It has been highly successful, over 10,000 reads as of mid-2016, with over 20 min average time on the page according to Google Analytics.

**2013**

Featured on BBC film: Insect Dissection: How Insects Work

**2012**

ScienceNow with slide show [link]

This Week in SCIENCE [link]

AAAS News [link]

Science Magazine Podcast [link]

NSF Science360 – Breaking Story [link]

NSF.gov News [link]

BBC World Service (min 50:00) [link]

Science and Development Network [link]

Voice of America

Le Figaro [link] AllAfrica.com [link] io9.com [link]

Radio New Zealand [link]

France24 [link]

AFP – Agence France-Presse [link]

PhysOrg [link]

ScienceCodex [link] ScienceDaily [link] labspaces [link]

White Mountain Conservation League [link]

Brunei Times [link]

SciShow interview with Hank Green:

http://www.youtube.com/watch?v=l79FuGuk1qE&feature=player\_embedded

Trained Phoenix Bioscience High School students (Gabrielle Wightman and Elizabeth

Palos) and teacher (Shoshanna Kroeger) in a summer research program (2012)

**2010**

Coverage by Silobreaker: http://www.silobreaker.com/high-oxygen-levels-spawn-monster-dragonflies5\_2263838725144313856

Coverage by Motherboard:

http://www.motherboard.tv/2010/11/1/scientists-are-breeding-giant-dragonflies--2

Coverage by TrueAuthority.com:

http://www.trueauthority.com/dinosaurs/death2.htm

Coverage by Softpedia: http://news.softpedia.com/news/Massive-Dragonflies-Roamed-the-Ancient-Earth164467.shtml

Coverage by Everything Dinosaur:

http://blog.everythingdinosaur.co.uk/blog/\_archives/2010/11/3/4671836.html

Coverage by Geeky Gadgets: http://www.geeky-gadgets.com/arizona-state-university-raising-giant-insects-tosolve-evolution-mystery-30-10-2010/

**2007**

Coverage by TrueAuthority.com

http://www.trueauthority.com/dinosaurs/death2.htm

**2006**

Dagmar Röhrlich, German Public Radio: Deutschlandfunk

Multiple science demonstrations at Waggoner Elementary School

Living on Earth Radio Interview

(http://www.loe.org/shows/segments.htm?programID=06-P1300042&segmentID=8)

American Physiological Society News Release

http://www.the-aps.org/press/conference/vabeach/11.htm

Coverage by PHYSORG.COM 16:51, Oct. 2006

http://www.physorg.com/news79804314.html

Coverage by EurekaAlert.com:

http://www.eurekalert.org/pub\_releases/2006-10/aps-gim100706.php

Inside JEB:

http://jeb.biologists.org/cgi/reprint/207/3/387

http://www.livescience.com/animalworld/061011\_giant\_insects.html

Coverage by ScienceAgogo: “Bow to Your Insect Overlords” http://www.scienceagogo.com/news/insects\_climate.shtml

Coverage by Softpedia, Article by Stefan Anitei

http://news.softpedia.com/news/More-Oxygen-Would-Mean-Giant-Insects37643.shtml

Coverage by What’s Next in Science and Technology

http://www.whatsnextnetwork.com/technology/index.php/2006/10/11/more\_oxyg en\_in\_atmosphere\_produced\_giant

Coverage by UnExplainedMysteries.Com

http://www.unexplained-mysteries.com/viewnews.php?id=80269

Coverage by Jennifer Vegas, Discovery News

http://dsc.discovery.com/news/2006/10/11/giantbug\_ani.html?category=dinosaurs &guid=20061011140030

Coverage by Mongabay.Com

http://news.mongabay.com/2006/1010-insects.html

ABC News: Dye Hard Science

http://abcnews.go.com/Technology/DyeHard/story?id=2578773&page=1

Coverage by Tribe.net

http://tribes.tribe.net/strangephenomena/thread/90bb6cc9-fb5f-4bca-be8e1c83c3bd1920

Coverage by CreationontheWeb.com

http://www.creationontheweb.com/content/view/4686/

Coverage by NSF

http://www.nsf.gov/news/mmg/mmg\_disp.cfm?med\_id=51729&from=googlebot(a t)googlebot.com

**2005**

Larry Hanlon, Discovery Magazine

(http://dsc.discovery.com/news/briefs/20050815/megainsect.html)

Science News Dec. 17, 2005 by Sid Perkins:

http://www.findarticles.com/p/articles/mi\_m1200/is\_25\_168/ai\_n16029291

**2004** New York Times interview: Front page article regarding giant insects

**2003** Several science demonstrations, Waggoner Elementary

**2002** Interviewed by John Doyle, British channel 6

 Monthly science demonstrations, Waggoner Elementary

 Biology career day: Kyrene Middle School

 Desert Botanical Gardens Presentation: “Hoppin’ Hoppers”

**2001** Interviewed by Annie Bates, BBC

**2000** Interviewed for Raven & Johnson’s Biology “Real People Doing

 Real Science” feature

**1999** Featured on KAET (Channel 8): ASU Research

**1998** ASU Insight and ASU Research articles re giant insects http://researchmag.asu.edu/stories/bugs.html

 http://researchmag.asu.edu/stories/test.html

**1997** Channel 3 Halloween interview re edible insects

**1996** Interview, CNN (Bailey Barash)

 Interview, BBC World News Service (Ruth Linton), phone interview broadcast world-wide on “Programme Science”, Oct. 4 and 5

 Interview, German News Service (Gisela Ostwald)

 Interview, Washington Post (Kurt Supple)

 Interview, New Scientist Magazine (Ben Crystal)

 Interview, Tribune Newspapers

**1995** Interview, Channel 12, Phoenix

 Inerview, Tribune Newspapers

**1993** Interview, NBC radio

**1991-1996** Judge, Broadmoor Science Fair

**1995-1996** Monthly science demonstrations, Waggonner Elementary School

# PUBLICATIONS (June 2024 h index 60, i10 = 146)

**BOOKS/EDITED BOOKS:**

Harrison, J.F., H. Arthur Woods and Stephen P. Roberts. *Ecological and Environmental Physiology of Insects*. 2012. ISBN:978-0-19-922594-1; 978-0-19-922595-8. Oxford Press. 392 pages.

**BOOK CHAPTERS:**

Harrison, J. and Wasserthal, L. (2012) Gaseous exchange, in *R.F. Chapman’s The Insects: Structure and Function* (eds S.J. Simpson and A.E. Douglas) Cambridge University Press.

J.S. Waters and J.F. Harrison. 2012. Insect metabolic rates. in Metabolic Ecology: A Scaling Approach. Editors: J. Brown, R. Sibly and A. Brown. John Wiley & Sons. ISBN: 978-0-470-67153-5.

Johnson, M.G., J.R. Glass, M.E. Dillon and J.F. Harrison. 2023. How will climatic warming affect insect pollinators? In: Advances in Insect Physiology. Environmental Threats to Pollinator Health and Fitness, J.F. Harrison (ed.) volume 64:1-115. Elsevier Press. https://doi.org/10.1016/bs.aiip.2023.01.001

Fisher, A.L. II, G. DeGrandi-Hoffman, L.H. Liao, R. Tadaei and J.F. Harrison. 2023. The challenge of balancing fungicide use and pollinator health. In: Advances in Insect Physiology. Environmental Threats to Pollinator Health and Fitness, J.F. Harrison (ed.) volume 64: 117 – 190. Elsevier Press. https://doi.org/10.1016/bs.aiip.2023.01.002

**COMMENTARIES, LETTERS:**

Harrison, J.F. 2022. Gregarious locusts down-regulate muscular catabolic capacities yet fly far. Proceedings of the National Academy of Sciences USA 119: e2122086119. d.o.i: 10.1073/pnas.2122086119

Fisher, A. I., M. Berenbaum, J. D. Crall, N. Desjardines, J. R. Glass, J. F. Harrison, L.

H. Liao, F. Muth, J. C. Nieh, R. C. F. Nocelli, N. Simon-Delso, H. Siviter, R. Tadei and K. Traynor (2021). "Protect pollinators - reform pesticide regulations." Nature

**595**: 172. https://doi.org/10.1038/d41586-021-01818-x

Harrison, J.F. 2021. Book Review of Fires of Life: Endothermy in Birds and Mammals, by Barry Gordon Lovegrove. Quarterly Review of Biology 96:150.

Harrison, J.F. 2020. Foreword to Volume 66 of the Annual Review of Entomology.

Harrison, J.F. 2019. Physiology: The highs and lows of bird flight. eLife 2019;

## 8:e50626 DOI: 10.7554/eLife.50626

Harrison, J.F. 2018. Reply to Glazier. Trends in Ecology and Evolution 33(4):238-239. DOI: 10.1016/j.tree.2018.01.004

Harrison, J.F. 2015. Evolvability and nonevolvability of allometric slopes.

Proceedings of the National Academy of Sciences, USA. 112:13426-13427.

DOI: 10.1073/pnas.1517621112. Web:

http://www.pnas.org/content/112/44/13426.short

**REVIEWED PUBLICATIONS:**

(176 Reviewed Publications total)

Treidel, L.A., K.D. Deem, M.K. Salcedo, M.H. Dickinson, H.S. Bruce, C.A. Darveau, B.H. Dickerson, O. Ellers, J.R. Glass, C.M. Gordon, J.F. Harrison, T.L. Hedrick, M.G. Johnson, J.E. Lebenzon, K. Niitepold, S.P. Sane, S. Sponberg, S. Talal, C.M. Williams, and E.S. Wold. In press. Insect flight: state of the field and future directions. Integrative and Comparative Biology.

Fox, T.P., Y.P. Raka, K. Smith and J.F. Harrison. In press. Climate change may release *Aedes aegypti* (Diptera:Culicidae) larvae from cold-inhibition and enable year-round development in a desert city. Ecological and Evolutionary Physiology.

Talal, S., A. Chahal, G.M. Osgood, J. Brosemann, J.F. Harrison and A.J. Cease. 2024. Target for lipid to carbohydrate intake minimizes cost of growth. Proceedings of the Royal Society B 291(2023): 20240424. <https://doi.org/10.1098/rspb.2024.0424>

Glass, J.R. and J.F. Harrison. 2024. A thermal performance curve perspective explains decades of disagreements over how air temperature affects the flight metabolism of honey bees. Journal of Experimental Biology 227(7): jeb246926. https://journals.biologists.com/jeb/article/227/7/jeb246926.

Desjardins, N.S., E. K. Chester, C. Ozturk, C.M. Lynch, J.F. Harrison and B.H. Smith. 2024. Synergistic negative effects between fungicides and high temperatures on navigation behavior in bees. Proceedings of the Royal Society B 291:20240040; https://doi.org/10.1098/rspb.2024.0040.

Glass, J.R., N.P. Burnett, S.A. Combes, E. Weisman, A. Helbing and J.F. Harrison. 2024. Flying nectar-loaded honey bees conserve water and improve heat tolerance by reducing wingbeat frequency and metabolic heat production. Proceedings of the National Academy of Science USA. 121(4): e2311025121. https://doi.org/10.1073/pnas.2311025121

Desjardines, N.S., J. Macias, D. Soto, J.F. Harrison and B.H. Smith. 2023. “Inert” co-formulants of a fungicide mediate acute effects on honey bee learning performance. In Press. Scientific Reports 13(1): 19458.

Cease, A.J., E.V. Trumper, H. Medina; F.C. Bazán; J. Learned; J. Frana, J.F. Harrison; N. Joaquin; M. Roca; J.E. Rojas; S. Talal and R.P. Overson. 2023. Field bands of marching locust juvenile show carbohydrate, not protein, limitation. Current Research in Insect Science 4:100069. https://www.sciencedirect.com/science/article/pii/S2666515823000185

Fisher, A.II, R. Tadei, M. Berenbaum, J. Nieh, H. Siviter, J. Crall, J. Glass, F. Muth, L.H. Liao, K. Trayno, N. DesJardins, R. Nocelli, N. Simon-Delso and J.F. Harrison. 2023. Breaking the cycle: Reforming pesticide regulations to protect pollinators. Bioscience biad088. https://doi.org/10.1093/biosci/biad088

Desjardines, N.S., J.F. Harrison and B.H. Smith. 2023. The effects of anthropogenic toxins on honey bee learning: research trends and significance. Apidologie 54:59. https://doi.org/10.1007/s13592-023-01040-w.

Johnson, M.G., K. Alvarez and J.F. Harrison. 2023. Water loss, not overheating, limits the mating activity period of an endothermic Sonoran Desert bee. Functional Ecology 37(11): 2855-2867. <https://doi.org/10.1111/1365-2435.14438>.

DesJardins, N.S., B.H. Smith and J.F. Harrison. 2023. A mitotoxic fungicide alters post-ingestive glucose signals necessary for associative learning in honey bees. Journal of Insect Physiology 149: 104554 <https://doi.org/10.1016/j.jinsphys.2023.104554>.

Chen, J., J. Rodriguez-Rincon, G. Degrandi-Hoffman, J.F. Fewell, J.F. Harrison, and Y. Kang. 2023. Impacts of seasonality and parasitism on honey bee population dynamics. Journal of Mathematical Biology 87(1):19. DOI: 10.1007/s00285-023-01952-2.

Harrison, J.F., E.K.G. McKenzie, S. Talal, J.J. Socha, M.W. Westneat and P.G.D. Matthews. 2023. Centenary commentary: Air sacs are a key adaptive trait of the insect respiratory system. Journal of Experimental Biology 226(10):jeb245712. <https://doi.org/10.1242/jeb.245712>.

Talal, S., S. Parmar, G.M. Osgood, J.F. Harrison, and A.J. Cease. 2023. High carbohydrate consumption increases lipid storage and promotes migratory flight. Journal of Experimental Biology 226(3):jeb245351. doi:

10.1242/jeb.245351. *Short-listed for Best JEB paper of the year*.

Siviter, H., A. Fisher; B. Baer; M.J.F. Brown I.F. Camargo, J. Cole; Y. Le Conte, B. Dorin, J.D. Evans, W. Farina, J. Fine, L.R. Fischer, M.P. D. Garratt, T.C. Giannini, T. Giray, H. Li-Byarlay, M.M. López-Uribe, J.C. Nieh, K.

Przybyla, N.E. Raine; A.M. Ray, G. Singh, M. Spivak, K. Traynor, K.M. Kapheim, J.F. Harrison. 2023. Protecting pollinators and our food supply: understanding and managing threats to pollinator health. Insectes Sociaux 70:5-15. https://link.springer.com/article/10.1007/s00040-022-00897-x.

 Johnson, M.D., J.R. Glass and J.F. Harrison. 2022. A desert bee uses an abdominal convector in flight. Journal of Experimental Biology 225(19): jeb244147. doi:10.1242/jeb244177. *Short-listed for Best JEB paper of the year.*

Wagner, J.M., C.J. Klok, M.E. Duell, J.J. Socha, G. Cao, H. Gong and J.F. Harrison. 2022. Isometric spiracular scaling in scarab beetles - implications for diffusive and advective oxygen transport. eLife **11**:e82129.

https://doi.org/10.7554/eLife.82129.

Fisher, A. III, J.R. Glass, C. Ozturk, N. Desjardines, Y. Raka, G. Degrandi-Hoffman, B.H. Smith, J.H. Fewell and J.F. Harrison. 2022. Seasonal variability in physiology and behavior affect the impact of fungicide exposure on honey bee (*Apis mellifera*) health. Environmental Pollution. 311:120010. https://doi.org/10.1016/j.envpol.2022.120010

Glass, J.R. and J.F. Harrison. The thermal performance curve for aerobic metabolism of a flying endotherm. 2022. Proceedings of the Royal Society B

289: 20220298. https://doi.org/10.1098/rspb.2022.0298

Duell, M.E. C.J. Klok, D.W. Roubik and J.F. Harrison. 2022. Size-dependent scaling of insect flight metabolism reveals energetic benefit to small body size. Integrative and Comparative Biology 62(5): 1429-1438.

Doi.org/10.1093/icb/icac131.

Youngblood, J.P., A.J. Cease, S. Talal, F. Copa, H.E. Medina, J.E. Rojas, E.V. Trumpter, M.J. Angilletta and J.F. Harrison. 2022. Climate change expected to improve digestive rate and trigger range expansion in outbreaking locusts. Ecological Monographs DOI: 10.1002/ecm.1550.

J.F. Harrison, A. Biewener, J.R. Bernhardt, J.R. Burger, J.H. Brown, Z.N. Coto,

M.E. Duell, M. Lynch, E.R. Moffett, T. Norin, A.K. Pettersen, F.A. Smith, U. Somjee, J.F.A. Tranielloand T.M. Williams. 2022. White paper: An integrated perspective on the causes of hypometric metabolic scaling in animals. Integrative and Comparative Biology 62(5): 1395-1418.

*https://academic.oup.com/icb/article/62/5/1395/6657804*

Ostwald, M.M., T.P. Fox, W.S. Hillery, Z. Shaffer, J.F. Harrison and J.H. Fewell. 2022. Group living confers thermal and physiological advantages in winter nests of a facultatively social bee. Animal Behavior. 189:59-67. *https://doi.org/10.1016/j.anbehav.2022.04.012*

Kapali, G.P., V. Callier, H. Broeker, P. Tank, S.J.L. Gascoigne, J.F. Harrison and Shingleton, A.W. 2022. A steroid hormone regulates growth in response to oxygen availability. Scientific Reports 12(1):4730. *doi: 10.1038/s41598022-08563-9*.

Fisher, A. II, T. Cogley, C. Ozturk, G. DeGrandi-Hoffman, B.H. Smith, O. Kaftanoglu, J.H. Fewell and J.F. Harrison. 2021. The active ingredients of a mitotoxic fungicide negatively affect pollen consumption and worker survival in lab-reared honey bees (*Apis mellifera*). Ecotoxicology and

Environmental Safety 226:112841. *https://doi.org/10.1016/j.ecoenv.2021.11284*1.

Desjardines, N., A. Fisher, C. Ozturk, J.H. Fewell, G. DeGrandi-Hoffman, J.F. Harrison and B.H. Smith. 2021. A common fungicide, Pristine, impairs associative learning performance in honey bees, *Apis mellifera*. 2021. Environmental Pollution 288: 117720. *https://doi.org/10.1016/j.envpol.2021.117720*

Somjee, U., E. Powell, T. Hickey, J.F. Harrison and C.J. Painting. 2021. Exaggerated sexually selected weapons maintained with disproportionately low metabolic costs in a single species with extreme size variation.

Functional Ecology. 35(10):2282-2293. *https://doi.org/10.1111/1365-2435.13888.*

Fisher, A. II, G. DeGrandi-Hoffman, B. Smith, C. Ozturk, O. Kaftanoglu, J.H.

Fewell and J.F. Harrison. 2021. Field cross-fostering and *in vitro* rearing demonstrate negative effects of both larval and adult exposure to a widely used fungicide in honey bees (*Apis mellifera*). Ecotoxicology and

Environmental Safety 217: 112251. *https://doi.org/10.1016/j.ecoenv.2021.112251.*

Ostwald, M.M., T.P. Fox, J.F. Harrison, and J.H. Fewell. 2021. Social consequences of energetically costly nest construction in a facultatively social bee. Proceedings of the Royal Society B. 288: 20210033.

*https://doi.org/10.1098/rspb.2021.0033.*

Ostwald, M.M., X. Guo, T. Wong, A. Malaekeh, J.F. Harrison and J.H. Fewell. 2021. Cooperation among unrelated ant queens provides persistent growth and survival benefits during colony ontogeny. Scientific Reports 11:8332. *doi.org/10.1038/s41598-021-87797-5.*

Glass, J.R., A. Fisher II, C. Ozturk, J.H. Fewell, G. DeGrandi-Hoffman and J.F. Harrison. 2021. Consumption of field-realistic doses of a widely used mito-toxic fungicide reduces thorax mass but does not negatively impact maximal flight capacities of the honey bee (*Apis mellifera*). Environmental Pollution. 274: 116533. *doi.org/ 10.1016/j.envpol.2021.116533*

Talal, S., A. Cease, R. Farington, H.E. Medina, J. Rojas and J.F. Harrison. 2021. High carbohydrate diet ingestion increases post-meal lipid synthesis and drives respiratory exchange ratios above 1. Journal of Experimental

Biology. 224(4): jeb240010. *doi.org/10.1242/jeb.240010*

Fisher, A. II, N. Desjardines, G. DeGrandi-Hoffman, B. Smith, M. Johnson, O. Kaftanoglu, T. Cogley, J.H. Fewell and J.F. Harrison. 2021. Colony field test reveals dramatically higher toxicity of a widely-used mito-toxic fungicide on honey bees (*Apis mellifera*). Environmental Pollution 269:115964. *doi.org/10.1016/j.envpol.2020.115964*

Talal, S. A.J. Cease, J.P. Youngblood, R. Farington, E.V. Trumper, H.E. Medina, J.E. Rojas, A.F. Copa, and J.F. Harrison. 2020. Plant carbohydrate content limits field performance and migratory capability of an outbreaking herbivore*.* Proceedings of the Royal Society Series B 287: 20202500.

*doi.org/10.1098/rspb.2020.2500*.

Glass, J.R., M. Duell and J.F. Harrison. 2020. Defensive biting by *Tetragonisca angustifola* is dangerous but not suicidal. Insectes Sociaux 67(4):515-522.

*doi.org/10.1007/s00040-020-00790-5*.

Harrison, J.F., W. Waser and S.K. Hetz. 2020. PO2 of the metathoracic ganglion in response to progressive hypoxia in an insect. Biology Letters 20200548.

*doi.org/10.1098/rsbl.2020.0548*.

VandenBrooks, J.M., C.F. Ford and J.F. Harrison. 2020. Responses to alteration of atmospheric oxygen and social environment suggest tradeoffs among growth rate, lifespan, and stress susceptibility in giant mealworms (*Zophobas morio*). Physiological and Biochemical Zoology. 93(5):358-368. *doi.org/10.1086/710726*.

Welch, L., K.M. Baudier and J.F. Harrison. 2020. Warmer temperatures increase leaf intake by increasing forager speed and success in *Atta colombica* during the rainy season. Insectes Sociaux 67:213-219.

*doi.org/10.1007/s00040-020-00749-6*.

Harrison, J.F., K. Adjerid, A. Kassi, C.J. Klok, J.M. Vandenbrooks, M.E. Duell, J.B. Campbell, S. Talal, C.D. Abdo, H. Pendar and J.J. Socha. 2020. Physiological responses to gravity in an insect. Proceedings of the National Academy of Sciences USA 117(4):2180-2186.

*https://doi.org/10.1073/pnas.1915424117*

Campbell, J.B., P. Overby, A. Gray, H. Smith and J.F. Harrison. 2019. Genome-wide association analysis of anoxia tolerance in *Drosophila melanogaster*. G3: Genes|Genomes|Genetics 9(9):2989-2999.

https://doi.org/10.1534/g3.119.400421.

Campbell, J.B, S. Werkhoven and J.F. Harrison. 2019. Metabolomic variation in anoxia tolerance of *Drosophila melanogaster*: evidence against substrate limitation and for roles of protective metabolites and paralytic hypometabolism. American Journal of Physiology 317(3):R442-R450. *https://doi.org/10.1152/ajpregu.00389.2018*

Ravn, M.V., J.B. Campbell, L.C.L. Gerber, J.F. Harrison and J. Overgaard.

2019. Effects of anoxia on ATP, water, ion and pH balance in an insect (*Locusta migratoria)*. Journal of Experimental Biology. 222:jeb190850. *doi.org:*

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