

Curriculum Vitae

Daniel B. Zurek, PhD

Postdoctoral Fellow
Department of Biological Sciences
University of Cincinnati
Phone.: +1 (617) 610-9633
Email: zurekdb@uc.edu
Website: danielzurek.com

Mailing Address:
309 Hill Street
Santa Monica, CA-90405

EDUCATION

2008-2012

Ph.D., Brain, Behaviour and Evolution, Vice Chancellor's Commendation for Academic Excellence (Highest Distinction)

Macquarie University, Sydney, Australia, Department of Brain, Behaviour and Evolution

Dissertation: "*The function of the anterior lateral eyes in the modular visual system of jumping spiders (Araneae, Salticidae)*"

Advisors: Ximena J. Nelson, David C. O'Carroll (University of Adelaide), Christopher S. Evans.

2001-2007

Diplom-Biologe, Grade 1.2 („very good“), Majors: Animal Physiology, Cell Biology, Zoology

Universität Kassel¹, Institute of Biology, Kassel, Germany

Max Planck Institute for Solid State Research², Evolutionary Biomaterials, Stuttgart, Germany

Thesis: "*Attachment and locomotion of developmental stages of *Gastrophysa viridula**"

Advisors: Stanislav N. Gorb², Jörg-Peter Ewert¹.

POSTDOCTORAL RESEARCH

January 2017 - now

University of Cincinnati, OH, USA. Morehouse Lab, Department of Biological Sciences

Sensory Drive, eye movements and gaze strategies, active vision, evolution of visual signals

May 2014 - December 2016

University of Pittsburgh, PA, USA. Morehouse Lab, Department of Biological Sciences

Physiology of color vision, Visual ecology of jumping spiders, Co-evolution of color vision and color signals.

May 2012 - April 2014

Cornell University, Ithaca, NY, USA. Gilbert Lab, Department of Entomology

Multimodal integration of sensory information during locomotion, dynamic vision in predator-prey interactions.

RESEARCH INTERESTS

Sensory guidance of behavior, Physiology of invertebrate visual systems, Dynamic vision, Mechanisms of target detection and tracking, Visual ecology in terrestrial light habitats, Evolution of signal diversity, Color vision, Evolution of sensory systems, Sensory drive theory, Multimodal integration of sensory information, Cognition and learning in invertebrates, Machine vision, Biomechanics of arthropod locomotion.

PUBLICATIONS

2017

NI Morehouse, E Buschbeck, [DB Zurek](#), M Steck, M Porter. *Molecular Evolution of Spider Vision: New Opportunities, Familiar Players*. **Biological Bulletin** 233

SA Echeverri, NI Morehouse, and [DB Zurek](#). *Control of signaling alignment during the dynamic courtship display of a jumping spider*. **Behavioral Ecology**, arx107

2016

[DB Zurek](#), SN Gorb, and D Voigt. *Changes in tarsal morphology and attachment ability to rough surfaces during ontogenesis in the beetle *Gastrophysa viridula* (Coleoptera, Chrysomelidae)*. **Arthropod Structure & Development** S1467-8039(16)30140-2

2015

TE White, RL Dalrymple, DWA Noble, JC O'Hanlon, [DB Zurek](#), KDL Umbers (Authors contributed equally). *Reproducible research in the study of biological coloration*. **Animal Behaviour** 106 (2015), 51-57

[DB Zurek](#), TW Cronin, LA Taylor, K Byrne, MLG Sullivan, and NI Morehouse. *Spectral filtering enables trichromatic vision in colorful jumping spiders*. **Current Biology** 25(10), R403-404
*Featured by *Science*, *National Geographic*, *Smithsonian*, etc.

[DB Zurek](#), SN Gorb, and D Voigt. *Locomotion and attachment of leaf beetle larvae*. **Interface Focus** 2014 5(1) 20140055.

2014

[DB Zurek](#), MQ Perkins, and C Gilbert. *Dynamic visual cues trigger jaw opening and closing by tiger beetles during pursuit of prey*. **Biology Letters** 20140760. *Cover

[DB Zurek](#) and C Gilbert. *Static antennae act as locomotory guides that compensate for visual motion blur in a diurnal, keen-eyed predator*. **Proceedings of the Royal Society B**, 281(1779) 20133072 *Featured by *National Geographic*

2012

[DB Zurek](#) and XJ Nelson. *Hyperacute motion detection by the lateral eyes of jumping spiders*. **Vision Research**, 66, 26-30

C Gilbert and [DB Zurek](#). *Visual Neuroscience: Fruit flies use directional motion disparities to segregate moving objects from the optic flow field*. **Current Biology**, 22(14), 565-567

[DB Zurek](#) and XJ Nelson. *Saccadic tracking of targets mediated by the anterior-lateral eyes of jumping spiders*. **Journal of Comparative Physiology A**, 198(6) 411-417

2010

[DB Zurek](#), AJ Taylor, CS Evans, XJ Nelson. *The role of the anterior lateral eyes in the vision-based behaviour of jumping spiders*. **Journal of Experimental Biology**, 213(14) 2372-2378, *Cover, **Featured in *Nature Research Highlights* vol. 466

FUNDING & GRANT ACTIVITY

Note: As a German citizen living in the USA, I was ineligible to apply for US and EU postdoctoral fellowships.

2016

NSF IOS #1557549. Co-developed and authored as Senior Personnel with Principal Investigator Nathan Morehouse (placed in panel ranking category “outstanding priority” as one of the top 2% of full proposals, \$730,000).

2014

Orchestrated “crowdfunding” campaign on Experiment.com, *Why are some jumping spiders so colorful?* raised \$7,357 from 90 backers to support field travel and equipment.

2013

NSF IOS #1353811 (reached Full Proposal round). Co-developed and co-authored with Principal Investigator Nathan Morehouse.

2011

Macquarie Postgraduate Research Fund (competitive travel grant), AU\$5,000.

Vice Chancellor’s Commendation for Outstanding Achievement, AU\$500.

2008–2012

Macquarie University Research Excellence Scholarship, AU\$22,000/yr stipend for 3.5 years

Macquarie Research Project Support Fund, AU\$21,000

German National Merit Foundation Scholarship (Studienstiftung des deutschen Volkes), €26,000 (Offered but declined)

TEACHING EXPERIENCE

2017

Department of Biological Sciences, University of Cincinnati, USA

Visual Communication in Science. Taught grad students photography & videography techniques, as well as outreach strategies for science communication.

2015–2016

Assemble, Pittsburgh, USA

Assemble is a non-profit that educates at-risk inner-city youth on scientific topics via “STEAM” principles (Science, Technology, Engineering, Art and Math). I created and taught after-school curricula on sensory biology for middle-school students in 2015 and 2016, and a summer camp in 2015.

2012–2014

Department of Entomology, Cornell University, Ithaca, USA

Spider Biology ENTO2150, Guest Lecturer for Dr. Linda Rayor

2009–2011

Department of Brain, Behaviour and Evolution, Macquarie University, Sydney, Australia

Introduction to Brain, Behaviour and Evolution, BBE100 (designed undergraduate lab and lectures)

Animal Behaviour, BBE200, Guest Lecturer for Dr. Ken Cheng

2010

Discipline of Physiology, University of Adelaide, Australia

Demonstrator, Human Physiology I

Supervised lab practicals, guided student-designed experiments, data analysis and presentation

2006

Department of Animal Physiology, Universität Kassel, Kassel, Germany

Teaching Assistant, Animal Physiology lab (Großpraktikum Tierphysiologie)

Supervised courses in sensory physiology.

2005–2006

Mobile Nachhilfe GmbH, Kassel, Germany

Tutored prep school students in Biology, Chemistry, Math and English.

MENTORSHIP

2017

University of Cincinnati, Cincinnati, OH, USA

David James Morris (PhD student)

Alexis Dodson (PhD student)

Isabella Geeding (Undergraduate Researcher)

Lexi Low (Undergraduate Researcher)

2014–2016

University of Massachusetts Amherst, MA, USA

Margaret Bruce (PhD student)

University of Pittsburgh, Pittsburgh, PA, USA

Sebastian Echeverri (PhD student)

Corey Forman (Undergraduate Researcher)

Zachary Zimmer (Undergraduate Researcher)

Ciara Kernan (Undergraduate Researcher)

John Goté (Undergraduate Researcher)

Margaret Mass (Undergraduate Researcher)

Sinjon Bartel (Undergraduate Researcher)

Riley Timbs (Undergraduate Researcher)

Zarreen Amin (Undergraduate Researcher)

Emily Maier (Undergraduate Researcher)

Alexandra Lysiak (Undergraduate Researcher)

Kevin Byrne (Undergraduate Researcher)

2013

Cornell University, Ithaca, NY, USA

Madeleine Perkins (Undergraduate Researcher)

2012

Macquarie University, Sydney, NSW, Australia

Emily Benn (Undergraduate Researcher)

INVITED PRESENTATIONS**2018**

Macro Photo/Videography Essentials. University of Florida, Entomology and Nematology Department.

Modular vision and the design of dynamic visual signals. University of Florida, Entomology and Nematology Department.

2016

Retinal specializations and the architecture of visual signals. American Arachnological Society Meeting, Golden, CO. Symposium: Visual information acquisition, processing, and cognition in spiders

2015

DB Zurek, TW Cronin, LA Taylor, K Byrne, MLG Sullivan, and NI Morehouse. *Spectral filtering enables trichromatic vision in the principal eyes of Habronattus jumping spiders*. Janelia Conference Insect Vision: Cells, Computation & Behavior

Eight-legged Casanovas: Courtship behavior of colorful jumping spiders. Valentine's lecture, Ecology Club, University of Pittsburgh, PA, USA

High performance in a small package: the visual systems of arthropod predators. Westminster College, New Wilmington, PA, USA

2014

Color vision in a colorful predator: light path absorbance and retinal sensitivities in jumping spiders. 15th International Behavioral Ecology Congress, ISBE, New York City, USA.

2013

Visual systems of predatory bugs. Snodgrass & Wigglesworth Club, Cornell University, Ithaca, NY, USA

The visual system of jumping spiders. Jugatae Seminar, Department of Entomology, Cornell University, Ithaca, NY, USA

2012

The right eyes for the job: Visually guided behavior of jumping spiders. Morehouse Lab, Department of Biological Sciences, University of Pittsburgh, PA, USA

Motion detection in the secondary eyes of jumping spiders. Colour Workshop, Department of Biology, Macquarie University, Sydney, NSW, Australia

2011

The not-so secondary eyes of jumping spiders. Frye Lab, Department of Integrative Biology and Physiology, University of California Los Angeles, CA, USA

CONTRIBUTED PRESENTATIONS**2018**

DB Zurek, SA Echeverri, S Long, E Jakob, NI Morehouse. *How Male Courtship Displays Manipulate Female Gaze In Colorful Jumping Spiders*, Society for Integrative and Comparative Biology, San Francisco, CA, USA.

2017

DB Zurek, SA Echeverri, S Long, E Jakob, NI Morehouse. *The Interaction Of Female Gaze And Male Courtship Displays In Habronattus Jumping Spiders*. Animal Behavior Society, Toronto, CA (Talk)

2015

C Gilbert, MQ Perkins, and DB Zurek. *Visual scanning by retinal movements of freely behaving jumping spiders*. Janelia Conference Insect Vision: Cells, Computation & Behavior (Talk)

Gilbert, C, Perkins MQ and Zurek DB. *Target image expansion and contraction during visually-guided pursuit of prey induce jaw opening and closing by tiger beetles*. Society for Integrative & Comparative Biology, W. Palm Beach, FL, USA. (Talk)

2014

Gilbert C and Zurek D. *Change of gaze by retinal movements during locomotion by jumping spiders*. Society for Neuroscience, Washington DC, USA. (Poster)

Gilbert, C, Perkins MQ and Zurek DB. *Dynamic visual cues trigger jaw opening and closing by tiger beetles during pursuit of prey*. J.B. Johnston Club, Washington DC, USA. (Talk)

Zurek DB and Gilbert C. *An insight into situational gaze movements of jumping spiders*. Poster Presentation, International Congress of Neuroethology 2014, Sapporo, Japan. (Poster)

2013

Zurek DB, and Gilbert C. *Running blind: Antennae are necessary and sufficient for obstacle negotiation in tiger beetles*. ABS 2013, Boulder, CO, USA. (Talk)

2012

Zurek DB and Nelson XJ. *Hyperacute motion detection by the lateral eyes of jumping spiders*. International Congress of Neuroethology, College Park, ML, USA (Poster)

2011

Zurek DB, O'Carroll DC and Nelson XJ. *Motion detection by the anterior lateral eyes of jumping spiders*. Gordon Research Conference Neuroethology, Easton, MA, USA. (Poster)

Zurek DB, O'Carroll DC and Nelson XJ. *How do salticid secondary eye optics correlate with visually guided behavior?* ABS/Ethology 2011, Bloomington, IN, USA. (Poster)

Zurek DB, O'Carroll DC and Nelson XJ. *Mapping of optics on the behaviour of jumping spiders*. ASSAB Conference 2011, Adelaide, Australia. (Talk)

2010

Zurek DB and Nelson XJ. *High acuity motion detection by the not-so-secondary eyes of jumping spiders*. International Congress of Neuroethology, Salamanca, Spain. (Poster)

Zurek DB, Evans CS, Taylor AJ and Nelson XJ. *The role of the anterior lateral eyes in the vision-based behaviour of jumping spiders*. Annual Meeting of the Society for Experimental Biology, Prague, Czech Republic. (Talk)

2009

Zurek DB, Evans CS and Nelson XJ. *Motion Perception in the Antero-Lateral Eyes of Bark-Dwelling Jumping Spiders*. ASSAB Conference, Auckland, New Zealand. (Talk)

2007

Zurek DB, Voigt D and Gorb SN. *The role of attachment organs in the larval locomotion of the beetle *Gastrophysa viridula**. Annual Meeting of the Society for Experimental Biology, Glasgow, UK. (Poster)

SERVICE & OUTREACH

Peer review: *Current Biology*, *American Naturalist*, *Animal Behavior*, *Journal of Experimental Biology*, *Biological Bulletins*, *Journal of Zoology*, *Ethology*, *Naturwissenschaften*, *Journal of Arachnology*, *African Journal of Agriculture*

2016

Grant Program Officer for the scientific crowdfunding company *Experiment*. Designed a competitive grant program in which 20 research proposals around “Animal Superpowers” raised funds from the public (\$41,000 from 1400 backers). I solicited proposals, edited text and pitch videos, and coached the campaigns. Eight campaigns reached their funding goals.

Educator with *Assemble*. I co-designed and taught an after-school curriculum on sensory biology for kids age 6-12.

2015

Symposium Organizer, *Information acquisition, processing, and cognition in spiders*, 20th International Congress of Arachnology, Golden, CO, USA.

Educator with *Assemble* Pittsburgh, I co-designed and created materials for an “Animal Superhero Camp” in which students researched animals with astonishing abilities, and created superhero costumes based on them.

Producer and Co-Host of *Crittersnap*, a Youtube series focused on Animal photography and videography. I record, edit, and post-process episodes hosted together with biologists David Duneau (Toulouse University), Sören Franzenburg (Cornell University), and Alberto Lopez (Smithsonian Institution).

Educator with *Assemble*. I designed an after-school curriculum that leverages the responsiveness of jumping spiders to video stimuli. Student groups created videos that competed for a spider’s attention in an iPod-based arena.

2014

Designed and ran a crowdfunding campaign on Experiment.com, to raise funds for a field expedition and communicate our research to the public. Produced a series of videos and materials that helped successfully fund the project with over \$7000 by 90 backers. Connected with the public on social media, radio shows and podcasts (KVRX Austin; *Breaking Bio*), newspaper and magazine features (local press up to *Science*).

Exhibitor at *SciTech Days*, Carnegie Science Center, Pittsburgh. Interacted with groups of children ages 6-12y about animal communication, invertebrate behavior, and spider biology.

Symposium Proposer/Organizer, *Color Signals in Terrestrial Invertebrates: Integrating Senders and Receivers*, 15th International Behavioral Ecology Congress, ISBE, New York City, USA.

2013

Exhibitor at *Insectapalooza*, Cornell University, an annual insect fair that attracts thousands of visitors for interactive experiences that feature hundreds of live insects, spiders, and other arthropods. I ran an exhibit on insect neurophysiology with live nerve recordings.

2012

Exhibition Consultant, *Spiders Alive!*, American Museum of Natural History NYC, USA. *Spiders Alive!* was a temporary exhibition (7/28/2012 – 1/6/2013) that explored spider anatomy, diversity, venom, silk, and behavior. It displayed 20 species of live spiders and featured larger-than-life models. I consulted museum writers on the section related to spider vision and salticids.

2011

Online Teaching Producer, Department of Biological Sciences, Macquarie University. Recorded, edited and published lectures for online access.

2002–2006

Student Council and Professorial Appointment Committee, Universität Kassel, Germany.

PROFESSIONAL SOCIETY MEMBERSHIPS

Society for Integrative and Comparative Biology

International Society for Behavioral Ecology

Animal Behavior Society

Society for Experimental Biology

International Society for Neuroethology

EXTRA QUALIFICATIONS

Cornell Postdoctoral Leadership Development Certificate 2014

Languages: German (native), English (fluent), French (good)

SELECTED MEDIA COVERAGE

Science, *Nature* Research Highlights, National Geographic, Los Angeles Times, Smithsonian Magazine, The Scientist Magazine, Not Exactly Rocket Science, Science Daily, Der Spiegel, Neue Zürcher Zeitung.