

Curriculum vitae

James S. Waters

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**Education**

- Present School of Life Sciences, Arizona State University, Tempe, AZ  
Pursuing Ph.D. in Biology, Advisor: Jon F. Harrison
- 2005 The University of Chicago, Chicago, IL  
A.B. in Mathematics
- 2001 The Bronx High School of Science, New York, NY

**Honors & Awards**

- 2008 National Science Foundation Graduate Research Fellowship
- 2008 Sigma Xi Grant In Aid of Research, \$929
- 2007 First Place Presentation, Arizona Imaging and Microanalysis Society  
Annual Meeting
- 2006 Nominated for GPSA Teaching Excellence Award
- 2005 Sigma Xi Science Prize, The University of Chicago
- 2005 President's Award for Excellence in Undergraduate Research and  
First Place Abstract, Chicago Area Undergraduate Research Symposium
- 2001 University of Chicago Merit Scholarship
- 1999 Eagle Scout, Boy Scouts of America

**Research Assistantship**

- 2007 Research Assistantship for Jon F. Harrison, "Developmental plasticity and evolution of *Drosophila* tracheole geometry after exposure to different oxygen partial pressures."
- 2005 Technician for Melina Hale at the University of Chicago, "Drosophila models of disease determined by synchrotron phase-contrast imaging."

**Teaching**

- 2007 Bio 361: Animal Physiology Lab, *Laboratory Teaching Assistant*
- 2006 Bio 100: The Living World, *Laboratory Teaching Assistant*

**Publications**

- John J. Socha, Mark W. Westneat, Jon F. Harrison, **James S. Waters**, and Wah-Keat Lee. (2007) Real-time phase contrast x-ray imaging: a new technique for the study of animal form and function. *BMC Biology*, 5:6. ["highly accessed" status]

### Manuscripts in preparation

**James S. Waters**, Mark W. Westneat, Kamel Fezzaa, Wah-Keat Lee, and John J. Socha. (2007) Kinematics of a bidirectional insect respiratory pump. To be submitted to *Biology Letters*.

John J. Socha, Kamel Fezzaa, Jon F. Harrison, Wah-Keat Lee, **James S. Waters**, Mark W. Westneat. The correlation of external CO<sub>2</sub> release with internal tracheal compressions in a ground beetle, *Platynus decentis*. To be submitted to *Journal of Experimental Biology*.

John J. Socha, Steven C. Cook, Kamel Fezzaa, Michael LaBarbera, Wah-Keat Lee, **James S. Waters**, Mark W. Westneat. Effects of viscosity on internal fluid transport during feeding in a butterfly, *Pieris rapae*. To be submitted to *Proceedings of the National Academy of Sciences of the United States of America*.

### Published abstracts

Mark W. Westneat, John J. Socha, **James S. Waters**, Melina E. Hale, and Wah-Keat Lee. (2006) The expiration data is today: Diversity of convective insect respiratory behavior visualized by synchrotron x-ray imaging. *Integrative and Comparative Biology* 46(6).

John J. Socha, **James S. Waters**, Mark W. Westneat, Michael LaBarbera, Steve Cook, Kamel Fezzaa, and Wah-Keat Lee. (2006) The Poise that refreshes: dynamics of internal food transport in a butterfly. *Integrative and Comparative Biology* 46(6).

Melina E. Hale, **James S. Waters**, Wah-Keat Lee, John J. Socha, Kamel Fezzaa, and Mark W. Westneat. (2006) Drawing inspiration from insect breathing and heaving conventional wisdom: Convective tracheal and air sac mechanisms in *Drosophila* visualized with x-ray imaging. *Integrative and Comparative Biology* 46(6).

**James S. Waters** and John J. Socha. (2005) Mechanics of tracheal compression in the bessbug, *Popilius disjunctus*. *Integrative and Comparative Biology* 45(6): 1209.

John J. Socha, Kamel Fezzaa, Wah-Keat Lee, **James S. Waters**, and Mark W. Westneat. (2004) Tracheal compression patterns involved in gas exchange in the ground beetle, *Platynus decentis*. *Integrative and Comparative Biology* 44(6): 748.

### Presentations

2007 Visualizing insect respiratory physiology and biomechanics. Annual Meeting, Arizona Imaging and Microanalysis Society. (first place poster)

- 2007 The expiration data is today: Diversity of convective insect respiratory behavior visualized by synchrotron x-ray imaging. Annual Meeting, Integrative and Comparative Biology. (poster)
- 2006 Transmission electron microscopy of *Drosophila* tracheoles. A.S.U. Bioimaging research group.
- 2006 Target of rapamycin (TOR) signaling and hypoxia. Comparative and environmental animal physiology course.
- 2006 Physical basis of synchrotron x-ray phase-contrast imaging. Bioimaging seminar. (invited class lecture)
- 2006 Bessbug tracheal compressions and material properties. Social Insect Research Group seminar.
- 2006 Polyphenic ants and tracheal compressions. Harrison lab meeting.
- 2006 Mechanics of tracheal compression in the bessbug, *Popilius disjunctus*. Annual Meeting, Integrative and Comparative Biology. (poster)
- 2005 Biomechanics of the insect tracheal system. Chicago Area Undergraduate Research Symposium. (poster)
- 2005 Tracheal compression patterns involved in gas exchange in the ground beetle, *Platynus decentis*. Annual Meeting, Integrative and Comparative Biology. (poster)

### **Service & Outreach**

- 2008 Mentoring undergraduate student who is assisting with my ant research
- 2007 Lead Keystone Montessori school trip to the ASU Insect Collection
- 2007 Writing article with Faye Farmer about online networking in academia
- 2007 Presenting a web publishing workshop for Women in Science and Engineering
- 2007 Developing educational website for the public to explore insect gigantism
- 2007 Volunteer at School of Life Sciences “See ASU” table, Wells Fargo Arena
- 2007 Volunteer judge for the Central Arizona Regional Science and Engineering Fair
- 2007 School of Life Sciences undergraduate brownbag panel speaker on “Choosing to go to graduate school.”
- 2007 Volunteer judge for the Ward Traditional Academy Science Fair
- 2007 Volunteer judge for the Chandler High School Science Fair
- 2007 Designed website for the Harrison Lab: [www.public.asu.edu/~icjfh](http://www.public.asu.edu/~icjfh)
- 2006 Organized the 2006 annual meeting of the Chicago Area Undergraduate Research Symposium (with co-organizer Kevin Miklasz)

## **Fieldwork**

- 2007 Advanced Photon Source, Argonne National Laboratory, Argonne, IL  
Awarded x-ray beamtime to record *Camponotus* respiratory patterns
- 2007 Collecting *Camponotus* and *Pheidole* queens in southern Arizona

## **Coursework**

- A.S.U. Bioengineering Transport Phenomena, Life History Theory, Bioimaging, Transmission Electron Microscopy Laboratory, Comparative & Environmental Animal Physiology, Entomology, Sociobiology, Environmental Biophysics
- Chicago Animal Locomotion, Biological Diversity, Biomechanics of Organisms, Scientific Illustration, Image Analysis in Biology, Mechanics, Electricity and Magnetism, Modern Physics, Astronomy, Medical Physics, Calculus, Analysis, Abstract Algebra, Number Theory, Mathematical Neuroscience, Nonlinear Dynamics
- Other Precision respirometry course, taught by John Lighton at Sable Systems International, March 10-14, 2007

## **Organizations**

Arizona Imaging and Microanalysis Society  
Society for Integrative and Comparative Biology  
Sigma Xi