Curriculum vitae

John J. Socha

Samuel Herrick Professor
Department of Mechanical Engineering
Virginia Tech
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Education

2002 Ph.D., Department of Organismal Biology and Anatomy, **The University of Chicago**
Thesis Title: "The biomechanics of flight in snakes"

1994 B.S., Physics; B.S., Biology, **Duke University**

Academic Positions

2024-present	**Samuel Herrick Professor**, Department of Mechanical Engineering, Virginia Tech
2024-present	**Affiliate Professor**, Department of Biomedical Engineering, Virginia Tech
2024-present	**Affiliate Professor**, Department of Entomology, Virginia Tech
2021-2024	**Samuel Herrick Professor**, Department of Biomedical Engineering and Mechanics, Virginia Tech
2019-2021	**Professor**, Department of Biomedical Engineering and Mechanics, Virginia Tech
2017-2022	**Director**, Biological Transport (BIOTRANS) Interdisciplinary Graduate Education Program (IGEP), Virginia Tech
2016-17, 22-23	**Co-Director**, Biological Transport (BIOTRANS) Interdisciplinary Graduate Education Program (IGEP), Virginia Tech
2014-2019	**Associate Professor**, Department of Biomedical Engineering and Mechanics (BEAM; merger of Engineering Science and Mechanics with Biomedical Eng.), Virginia Tech
2011-2024	**Affiliate Professor**, Department of Mechanical Engineering, Virginia Tech
2008-present	**Core Faculty Member**, Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences
2008-present	**Affiliate Professor**, Department of Biological Sciences, Virginia Tech
2008-2014	**Assistant Professor**, Department of Engineering Science and Mechanics, Virginia Tech
2007-2008	**Research Scientist**, Argonne National Laboratory
2004-2007	**Ugo Fano Postdoctoral Fellow**, Argonne National Laboratory
2003-2004	**Research Associate**, The Field Museum, Fishes Division
2003-2008	**Lecturer**, Biological Sciences Division, University of Chicago
1994-1996	**Science department head and teacher**, Centerville High School, Centerville, La.

Fellowships, Honors, and Awards

2025 **Postdoctoral Faculty Mentoring Award**, Virginia Tech

2020 **Leader in Research Award**, BEAM department, Virginia Tech

2018 **Dean's Award for Excellence in Outreach**, College of Engineering, Virginia Tech

2016 **College of Engineering Faculty Fellow**, Virginia Tech
2014 **NSF CAREER award**, Physics Division (PHY), Physics of Living Systems (PoLS)
2012 **Scholar of the Week,** Virginia Tech (September 24, 2012)
2011 **Invited symposium participant,** 2011 National Academy of Engineering Frontiers of Engineering Education
2010 **Liviu Librescu Faculty Prize**, Virginia Tech
2010 **Outstanding New Assistant Professor Award**, College of Engineering, Virginia Tech
2008 **U.S. National Committee on Theoretical and Applied Mechanics (USNC/TAM) Fellowship Grant Award**
2004 **Ugo Fano Named Postdoctoral Fellowship**, Argonne National Laboratory
2001 **Harper Fellowship**, University of Chicago
1999 **Berkman Fellowship**, University of Chicago
1998 **Stoye Award in General Herpetology**, American Society of Ichthyologists and Herpetologists
1998 **Biodiversity Training Grant**, University of Chicago
1997 **Pre-doctoral Graduate Fellowship Honorable Mention**, National Science Foundation
1992 **NASA Langley Aerospace Summer Scholar**, summers of 1992 & 1993

Publications

Journal articles *(*denotes student author)*

Dannenfeld, T., M. Ras, L. Adam, J.U. Hammel, F. Friedrich, X. Luo, K. Engelkes, M. Gabelaia, T. Roeder, J. Bossen, J.J. Socha, S. Wilmsen, H. Herhold, J. Vehof, and B. Wipfler. A guide for scanning, segmenting and visualizing the arthropod tracheal system with µ-CT. *In press*, **Annales Zoologici**.

Scherer, J.*, H. Pendar, J.J. Socha. 2026. Substrate-dependent friction and climbing performance in a flying snake. **Bioinspiration & Biomimetics** 21 (2026) 066007.

Graham, M.*, H.C. Astley, C.J. Clemente, J.J. Socha. 2026. Torque limitations on cantilevering in jumping and gliding snakes. **Journal of Experimental Biology** 229 (16): jeb251396.

Webster, M.*, R. Wijeratne*, J.J. Socha, and R. De Vita. 2025. Pressure-induced circumferential and longitudinal deformations of tracheal tubes in the American cockroach. **Journal of Experimental Biology**, 228 (23): jeb251415.

Ryu, S., H. Zhang, T. Palone, M.K. Salcedo, and J.J. Socha. 2025. A microfluidic study of transient perfusion through the forewing of dragonfly. **Lab on a Chip** 25, 3718-3729**.**

Mortensen, T.L.*, A. Marsh*, J. Anderson, Jr.*, I.T. Moore, B.Z. Socha*, A. Moore*, E. Torres Pacaya, J.J. Socha. 2025. Two steps forward, one back: kinematic observations of a South American Small-eyed Coralsnake, *Micrurus lemniscatus* (Linnaeus, 1758), regurgitating a Brown-banded Watersnake, *Helicops angulatus* (Linnaeus, 1758). **Herpetological Notes** 18:293-298

Socha, J.J., H. Pendar, J.M. Rieser. 2025. News and Views: Anacondas get vertical on the ground. **Nature Physics** 1-2.

Weiss, T.*, G.B. Gillis, and J.J. Socha. 2024. Skittering locomotion in the cricket frog *Acris crepitans*: a form of porpoising. **Journal of Experimental Biology** 227, jeb249403.

Yeaton, I.J.*, S.D. Ross, and J.J. Socha. 2024. Quasi-steady aerodynamic theory under-predicts glide performance in flying snakes. **Journal of Experimental Biology** 227 (19): jeb247989.

Socha, J.J. and P.C. Khandelwal. 2024. Animal locomotion: Wing-like femoral lobes help orchid mantid nymphs glide. **Current Biology** 34(3) R94-98.

Graham, M.* and J.J. Socha. 2023. Dynamic gap crossing in *Dendrelaphis*, the sister taxon of flying snakes. **Journal of Experimental Biology** 226: jeb245094**.** [cover]

Khandelwal, P.C., M.A. Zakaria*, and J.J. Socha. 2023. A year at the forefront of gliding locomotion. **Biology Open** 12 (8): bio059973.

Ortega-Jimenez, V.M., A. Jusufi, C. Brown, Y. Zeng, S. Kumar, R. Siddall, B. Kim, E. Challita, Z. Pavlik, M. Priess, T. Umhofer, J.-S. Koh, J.J. Socha, R. Dudley, M.S. Bhamla. 2023. Air-to-land transitions: from wingless animals and plant seeds to shuttlecocks and bio-inspired robots. **Bioinspiration & Biomimetics** 18 (2023) 051001.

Hillen, A.P.*, J.R. Foley, M.K. Salcedo, J.J. Socha, and S.M. Salom. 2023. 3D X-ray analysis of *Laricobius* (Coleoptera: Derodontidae), a specialist predator of *Adelges tsugae* (Hemiptera: Adelgidae). **Journal of Insect Science** 23(3): 19; 1–7**.**

Harrison, J.F., E.K.G. McKenzie, S. Talal, J.J. Socha, M.W. Westneat, and P.G.D. Matthews. 2023. Air sacs are a key adaptive trait of the insect respiratory system. **Journal of Experimental Biology** 226: jeb245712.

Salcedo, M.K., T.E. Ellis*, A.S. Sáenz*, J.L. Lu*, T. Worrell*, M.L. Madigan, and J.J. Socha. 2023. Transient use of hemolymph for hydraulic wing expansion in cicadas. **Scientific Reports** 13, 6298 (2023).

Mikel-Stites*, M.R., M.K. Salcedo, J.J. Socha, P.E. Marek, and A.E. Staples. 2023. A biologically accurate model of directional hearing in the parasitoid fly *Ormia ochracea.* **Bioinspiration & Biomimetics** 18(3) 035007.

Whitehead, J.G.*, T. Worrell*, and J.J. Socha. 2023. Mallard landing behavior follows a $\dot{\tau}$-constant braking strategy. **Journal of Experimental Biology** 226 (5): jeb244256.

Salcedo, M.K., B.H. Jun*, J.J. Socha, P.P. Vlachos, N.E. Pierce, and S.A. Combes. 2023. Complex hemolymph circulation patterns in locust wings. **Communications Biology** 6, 313 (2023).

Dellinger, S.B.*, R. De Vita, P.P. Vlachos, M.M. Muñoz, and J.J. Socha. 2023. Material properties of skin in a flying snake (*Chrysopelea ornata*). **Journal of Experimental Zoology A** 339: 269–283.

Gong, Y.*, J. Wang, J.J. Socha, and H. Dong. 2022. Computational analysis of flying-snake-like horizontal undulation during gliding flight. **Physics of Fluids** 34: 121907.

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.

Renner*, K.E., A.T. Peebles*, J.J. Socha, and R.M. Queen. 2022. The impact of sampling frequency on kinetic outcomes. **Journal of Biomechanics** 135 (2022): 111034.

Graham, M.* and J.J. Socha. 2021. Dynamic movements facilitate extreme gap crossing in flying snakes. **Journal of Experimental Biology** 224 (20): jeb242923.

Jafari, F.*, Holden, D.*, R. La Foy*, P.P. Vlachos, and J.J. Socha. 2021. The aerodynamics of flying snake airfoils in tandem configuration. **Journal of Experimental Biology** 224(14): jeb233635.

Chatterjee, K.*, P.M. Graybill, J.J. Socha, R.V. Davalos, and A.E. Staples. 2021. Frequency-specific, valveless flow control in insect-mimetic microfluidic devices. **Bioinspiration and Biomimetics** 16(3) 036004.

Bolmin, O.*, J.J. Socha, A.C. Dunn, M. Alleyne, and A.A. Wissa. 2021. Latch, load, and release: how nonlinear elasticity and damping govern ultrafast dynamics in click beetles. **Proceedings of the National Academy of Sciences of the United States of America**. 188(5):118 e2014569118.

Zamore, S.A., N. Araujo*, and J.J. Socha. 2020. Visual acuity in the flying snake, *Chrysopelea paradisi*. **Integrative and Comparative Biology**. Invited paper for the 2020 SICB symposium "Long limbless locomotors: The mechanics and biology of elongate, limbless vertebrate locomotion". doi.org/10.1093/icb/icaa143.

Salcedo, M. and J.J. Socha. 2020. Circulation in insect wings. **Integrative and Comparative Biology,** 60(5): 1208–1220. Invited paper for the 2020 SICB symposium "Melding Modeling and Morphology: integrating approaches to understand the evolution of form and function".

Peebles, A.T.*, M.M. Carrol, J.J. Socha, D.O. Schmitt, and R.M. Queen. 2020. Validity of using 2D video analysis and automated marker tracking to assess continuous sagittal plane running kinematics. **Annals of Biomedical Engineering** 10.1007/s10439-020-02569-y.

Yeaton, I.J.*, G. Baumgardner*, S.D. Ross, and J.J. Socha. 2020. Undulation enables gliding in flying snakes. **Nature Physics** 16: 974-982.

Harrison, J.F., K. Adjerid*, A. Kassi, C.J. Klok, J.M. VandenBrooks, M.E. Duell, J.E. Campbell, S. Talal, E. Alanis, C. Abdo, H. Pendar, J.J. Socha. 2020. Physiological responses to gravity in an insect. **Proceedings of the National Academy of Sciences of the United States of America** 117(4): 2180-2186.

Graham, M.* and J.J. Socha. 2020. Going the distance: The biomechanics of gap-crossing behaviors. **Journal of Experimental Zoology A** 333: 60-73**.** Invited paper for special issue in honor of R. McNeil Alexander.

Pendar*, H., J. Aviles*, K. Adjerid*, C. Schoenewald*, and J.J. Socha. 2019. Functional compartmentalization in the hemocoel of insects. **Scientific Reports** 9(1): 6075.

Hochgraf, J.S.*, J.S. Waters, J.J. Socha. 2018. Patterns of tracheal compression in the thorax of the ground beetle, *Platynus decentis*. Invited paper for special issue on ecology and evolution, **Yale Journal of Biology and Medicine** 91(4): 409-430.

Kenny, M.C.*, M.N. Giarra*, E. Granata*, J.J. Socha. 2018. How temperature influences the viscosity of hornworm hemolymph. **Journal of Experimental Biology** 221(21): jeb186338.

Harrison, J.F., J.S. Waters, T.A. Biddulph*, A. Kovacevic*, C.J. Klok, and J.J. Socha. 2018. Developmental plasticity and stability in the tracheal networks supplying *Drosophila* flight muscle in response to rearing oxygen level. **Journal of Insect Physiology** 106(2018): 189-198.

Kikuchi, K., M.A. Stremler, W.-K. Lee, S. Chatterjee*, O. Mochizuki, and J.J. Socha. 2018. Burst mode pumping: A new mechanism of drinking in mosquitoes. **Scientific Reports** 8(1): 4885.

Jafari, F.*, S. Tahmasian, S.D. Ross, and J.J. Socha. 2017. Control of gliding in a flying snake-inspired n-chain model. **Bioinspiration and Biomimetics** 12(6) 066002.

Yeaton, I.J.*, J.J. Socha, and S.D. Ross. 2017. Global dynamics of non-equilibrium gliding in animals. **Bioinspiration and Biomimetics** 12(2): 026013.

Laha, B., D.A. Bowman, and J.J. Socha. 2016. Bare-hand volume cracker for raw volume data analysis. **Frontiers in Robotics and AI** 3: 56.

Pendar, H., J.J. Socha, and J. Chung. 2016. Recovering signals in physiological systems with large datasets. **Biology Open** 5, 1163-1174.

Gart*, S., J.J. Socha, P.P. Vlachos, and S. Jung. 2015. Dogs lap using acceleration-driven open pumping. **Proceedings of the National Academy of Sciences of the United States of America** 112 (52): 15798-15802. [cover]

Webster*, M., J.J. Socha, L. Teresi, P. Nardinocchi, and R. De Vita, 2015. Structure of tracheae and the functional implications for collapse in the American cockroach. **Bioinspiration and Biomimetics** 10 (2015): 066011.

Pendar*, H. and J.J. Socha. 2015. Estimation of instantaneous gas exchange in flow-through respirometry systems: A modern revision of Bartholomew's Z-transform method. ***PLoS ONE*** 10 (10): e0139508.

Pendar*, H., M.C. Kenny*, and J.J. Socha. 2015. Tracheal compression in pupae of the beetle *Zophobas morio*. **Biology Letters** 11 (6): 20150259. [cover]

Socha, J.J., F. Jafari*, Y. Munk, and G. Byrnes. 2015. How animals glide: from trajectory to morphology. **Canadian Journal of Zoology** 93: 901-924. (Review for a special issue on animal flight.)

Socha, J.J. Of snakes and robots. 2014. **Science** 346 (6206): 160-161.

Jafari, F.*, S.D. Ross, P.P. Vlachos, and J.J. Socha. 2014. A theoretical analysis of gliding in flying snakes. **Bioinspiration and Biomimetics** 9(2): 025014. (Invited paper for a special issue on "Bio-inspired Flight Control")

Becker, W.*, M.R. Webster*, J.J. Socha, and R. De Vita. 2014. Variation in tensile properties of tracheal tubes in the American cockroach. **Smart Materials and Structures** 23 (5): 057001.

Laha, B.*, D.A. Bowman, and J.J. Socha. 2014. Effects of VR system fidelity on analyzing isosurface visualization of volume datasets. **IEEE Transactions on Visualization and Computer Graphics** (Proceedings of Virtual Reality 2013), 20 (4): 513-522.

Krishnan, A.*, J.J. Socha, P.P. Vlachos, and L.A. Barba. 2014. Lift and wakes of flying snakes. **Physics of Fluids**. **26**: 031901.

Holden, D.*, J.J. Socha, N.D. Cardwell, and P.P. Vlachos. 2014. Aerodynamics of the flying snake, *Chrysopelea paradisi*: how a bluff-body cross-sectional shape contributes to gliding performance. **Journal of Experimental Biology** 217 (3): 382-394. [cover]

Greenlee, K.J., J.J. Socha, H.B. Eubanks, G. Thapa, P. Pedersen, W.-K. Lee, and S.D. Kirkton. 2013. Hypoxia-induced compression in the tracheal system of the tobacco hornworm caterpillar, *Manduca sexta* L. **Journal of Experimental Biology** 216 (12): 2293-2301.

Waters, J.S., W.-K. Lee, M.W. Westneat, and J.J. Socha. 2013. Dynamics of tracheal compression in the horned passalus beetle. **American Journal of Physiology: Regulatory, Integrative and Comparative Physiology**, 304:R621-R627.

Harrison, J.F., J.S. Waters, A.J. Cease, J.M. VandenBrooks, V. Callier, C.J. Klok, K. Shaffer, and J.J. Socha. 2013. How locusts breathe. **Physiology**, 28: 18-27.

Magwene, P.M. and J.J. Socha. 2013. Biomechanics of turtle shells: how whole shells fail in compression. **Journal of Experimental Zoology A**, 319A:86-98. [published online, 2012]

Socha, J.J. 2011. Gliding flight in *Chrysopelea*: Turning a snake into a wing. **Integrative and Comparative Biology**, 51(6): 969–982. [cover]

Webster, M.R.*, R. De Vita, J.N. Twigg, and J.J. Socha. 2011. Mechanical properties of tracheal tubes in the American cockroach (*Periplaneta americana*). **Smart Materials and Structures**, 20 (2011) 094017.

Socha, J.J., K. Miklasz*, F. Jafari*, and P.P. Vlachos. 2010. Non-equilibrium trajectory dynamics and the kinematics of gliding in a flying snake. **Bioinspiration and Biomimetics**, 5 (2010) 045002. [contributed to cover]

Simon, M.A., W.A. Woods, Y.V. Serebrenik, S.M. Simon, L.I. van Griethuijsen, J.J. Socha, W.-K. Lee, and B.A. Trimmer. 2010. Visceral-locomotory pistoning in crawling caterpillars (*Manduca sexta*). **Current Biology** 20: 1-6.

Socha, J.J., T. Förster, and K.J. Greenlee. 2010. Issues of convection in insect respiration: Insights from synchrotron x-ray imaging and beyond. **Respiratory Physiology and Neurobiology**, 173S (2010) S65–S73.

Miklasz, K.*, M. LaBarbera, X. Chen, and J.J. Socha. 2010. Effects of body cross-sectional shape on flying snake aerodynamics. **Experimental Mechanics** 50(9): 1335-1348. Invited paper, special issue on animal locomotion. [cover]

Dean, M.N., J.J. Socha, K.M. Claeson, B.K. Hall, and A.P. Summers. 2010. Canaliculi in the tessellated skeleton of cartilaginous fishes. **Journal of Applied Ichthyology** 26(2010): 263-267.

Sinclair, B.J., A.G. Gibbs, W.-K. Lee, A. Rajamohan, S.P. Roberts, and J.J. Socha. 2009. Synchrotron x-ray visualisation of ice formation in insects during lethal and non-lethal freezing. **PLoS ONE** 4(12): e8259.

O'Keefe, F.R., H.P. Street, J.P. Cavigelli, J.J. Socha, and R.D. O'Keefe. 2009. A plesiosaur containing an ichthyosaur embryo as stomach contents from the Sundance Formation of the Bighorn Basin, Wyoming. **Journal of Vertebrate Paleontology** 29(4): 1306-1310.

Lee, W.-K. and J.J. Socha. 2009. Direct visualization of hemolymph flow in the heart of a grasshopper (*Schistocerca americana*). **BMC Physiology** 9:2. ['Highly accessed' status]

Socha, J.J., W.-K. Lee, J.F. Harrison, J.S. Waters*, Fezzaa, K., M.W. Westneat. 2008. Correlated patterns of tracheal compression and convective gas exchange in a carabid beetle. **Journal of Experimental Biology** 211: 3409-3420. [cover]

Westneat, M.W., J.J. Socha, and W.-K. Lee. 2008. Advances in biological structure, function and physiology using synchrotron x-ray imaging. **Annual Review of Physiology** 70: 119-142.

Kaiser, A., C.J. Klok, J.J. Socha, W.-K. Lee, M.C. Quinlan, and J.F. Harrison. 2007. Increase in tracheal investment with beetle size supports hypothesis of oxygen limitation on insect gigantism. **Proceedings of the National Academy of Sciences of the United States of America** 104 (32): 13198-13203.

Socha, J.J., M.W. Westneat, J.F. Harrison, J.S. Waters*, and W.-K. 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]

Socha, J.J. 2006. Becoming airborne without wings: the kinematics of takeoff in a flying snake, *Chrysopelea paradisi*. **Journal of Experimental Biology** 209 (17): 3358-3369. [cover]

Socha, J.J., M. LaBarbera, and T. O'Dempsey. 2005. A three-dimensional kinematic analysis of gliding in a flying snake, *Chrysopelea paradisi*. **Journal of Experimental Biology** 208 (10): 1817-1833. [cover]

Socha, J.J. and M. LaBarbera. 2005. Effects of size and behavior on aerial performance of two species of flying snakes (*Chrysopelea*). **Journal of Experimental Biology** 208 (10): 1835-1847.

Socha, J.J. and C.A. Sidor. 2005. *Chrysopelea ornata, C. paradisi* (Flying Snakes). Behavior. **Herpetological Review** 36(2): 190-191.

Socha, J.J. 2002. Gliding flight in the paradise tree snake. **Nature** 418: 603-604.

Refereed conference papers

Zakaria, M.A.*, C.A. Woolsey, P.C. Khandelwal, J.J. Socha, S.D. Ross. Side forces in gliding flight of *Draco* lizards. **AIAA SciTech Forum**, AIAA 2026.

Ross, S.D., M.A. Zakaria*, J.J. Socha, T. Hedrick, and P. Khandelwal. 2024. Tail-assisted pitch control in flying lizards. **AIAA SciTech Forum**, AIAA 2024-2689. pp. 1-8.

Laha, B., D.A. Bowman, D.H. Laidlaw, and J.J. Socha. 2015. A classification of user tasks in visual analysis of volume data. **Scientific Visualization Conference (SciVis)**, 2015 IEEE. IEEE. pp. 1-8.

Aboelkassem, Y.*, A.E. Staples, J.J. Socha. 2010. Microscale flow pumping inspired by rhythmic tracheal compressions in insects. **Proceedings of the ASME 2011 Pressure Vessels and Piping Conference** (PVP 2011), July 17-21, 2011, Baltimore, Maryland, USA. Paper Number: PVP2011-57061.

Webster, M.R.*, R. De Vita, J.N. Twigg*, J.J. Socha. 2010. Tensile properties of insect tracheal tubes, **Proceedings of ASME (SMASIS)**, September 28-October 1, 2010, Philadelphia, Pennsylvania, USA. Paper Number: SMASIS2010-3859.

Miklasz, K.*, M. LaBarbera, J.J. Socha. 2008. The effect of body cross-sectional shape on glide force production in 'flying' snakes. **22nd International Congress of Theoretical and Applied Mechanics**, Adelaide, Australia.

Socha J.J., F. De Carlo. 2008. Use of synchrotron tomography to image naturalistic anatomy in insects. In: **Developments in X-Ray Tomography VI: 2008**; San Diego, CA, USA: SPIE; 2008: 70780A-70787.

Book chapters

Khandelwhal, P., S.D. Ross, H. Dong, and J.J. Socha. 2023. Convergence in Gliding Animals: Morphology, Behavior, and Mechanics. In: **Convergent Evolution**, pp 391-429. Eds V.L. Bels and A.P. Russell, Springer, New York. https://doi.org/10.1007/978-3-031-11441-0_13

Klok, C.J., A. Kaiser, J.J. Socha, W.-K. Lee, and J. F. Harrison. 2016. Multigenerational effects of rearing atmospheric oxygen level on the tracheal dimensions and diffusing capacities of pupal and adult *Drosophila melanogaster*. In: **Hypoxia and Cancer,** pp. 285-300. Eds. R.C. Roach et al., Springer, New York.

Socha, J.J. and J.R. Grubich. 2010. Biomechanically Inspired Robotics. In: **Bio-inspired Innovation and National Security**. Eds. R.E. Armstrong, M.D. Drapeau, C.A. Loeb, J.J. Valdes. National Defense University Press, Washington, D.C. pp 195-206.

Other publications

Socha, J.J. 2020. Flying lizards plan ahead to avoid clutter. Outside JEB, **Journal of Experimental Biology** 2020 (223).

Socha, J.J. 2011. To catch a flying snake. Essay in **Open Magazine**, April 23, 2011.

Socha, J.J. 2004. Flying snakes. In abheben! **1000 traume vom fliegen, art kite museum GmbH**. Hildegard Mannheims, ed. pp. 236-239.

Socha, J.J. 1999. Mary Anning. In **Encyclopedia of Paleontology, Vol. 1**. R. Singer, ed. Chicago: Fitzroy Dearborn Publishers, pp. 74-75.

Socha, J.J. 1999. Harry Govier Seeley. In **Encyclopedia of Paleontology, Vol. 2**. R. Singer, ed. Chicago: Fitzroy Dearborn Publishers, pp. 1080-1082.

Manuscripts in review (available upon request)

Mathur, T.*, J. Gibson, L. Zhang*, S. Wilmsen, O. Bolmin, E. Azizi, J.J. Socha, M. Alleyne, and A. Wissa. Energy-based integrated framework for latch-mediated spring actuation. *In review*, Journal of Experimental Biology.

Kenny, M.C.*, L.A. Miller, M.A. Stremler, A.E. Staples, S. Khan*, and J.J. Socha. Tracheal branching in an actively ventilating beetle does not follow Murray's law. *In review,* Journal of Morphology.

Anand, P.*, A. Singh*, J.J. Socha, P.P. Vlachos. The oscillating snake tongue entrains fluid outside its path to enhance vortex-driven chemosensory sampling. *In review*, Bioinspiration & Biomimetics.

Dannenfeld, T.M., L. Adam, M. Ras, M. Gabelaia, J.U. Hammel, F. Friedrich, L.Xiaozhu, L.R. Beische, P.T. Rühr, L. Rühlke, J.J. Socha, Sara Wilmsen, G. Jijon, J. Vehof, P.B. Frandsen, B. Wipfler. Tracheal scaling constrains gigantism in flying insects with air sacs. *In review*, Nature.

Manuscripts in preparation (available upon request)

Whitehead, J.G.*, S. Jung, and J.J. Socha. Mallard landing approach kinematics driven primarily by horizontal impact velocity.

Adjerid, K.*, M.C. Kenny*, J.F. Garrett*, R. De Vita, and J.J. Socha. Relationship of structure and material properties to tracheal collapse in darkling beetles.

Zakaria, M.*, P.C. Khandelwal, S.R. Ross, J.J. Socha. Tail-assisted pitch control in flying lizards.

Fox, T.*, J.J. Socha, and J.F. Harrison. Subelytral mysteries: Unidirectional airflow flushes tracheal system with O_2 while CO_2 and H_20 emit by diffusion by diffusion/advection through the leaky elytra of a darkling beetle, *Zophobas morio*.

Clark, E.G., S. Rezaie, D.Y. Parkinson, H. Barnard, A. Brown, J.J. Socha, A.J. McElrone, C.R. Brodersen, K. Fezzaa, D. Cornara, L. De La Fuente, and R. Almeida. Voracious vectors: Quantifying extreme xylem sap ingestion velocities in sharpshooters.

Socha, J.J., J. Taylor*, J. Anderson Jr.*, B.Z. Socha*, A. Moore*, I.T. Moore, T. Mortensen*, E. Torres Pacaya, and A. Marsh*. Arboreal jumping in the sipo snake (*Chironius*): Evolutionary perspectives on impulsive locomotions in snakes.

Anderson Jr.*, J., I.T. Moore, J. Pulliam*, J. Wong, C. Barnett*, U. Grafe, S. Khalid, and J.J. Socha. How do perch height and target presence influence gap-crossing behavior in two species of arboreal colubrid snakes?

Sponsored research

2025 **ICAT SEAD (Institute for Creativity, Arts, and Technology; Science, Engineering, Art, and Design) Grant,** "Flying squirrels in a VR arena: A new frontier in animal motion research" PI: J. Socha. Co-PI's: Shane Ross, Pranav Khandelwal, Nicole Abaid. 8/1/2025–05/31/2026. $12,000.

2025 **Virginia Tech CMB (Center for Mathematical Biology) Grant,** "Biological rockets: Developing a dynamical model of squid flight" PI: J. Socha. Co-PI: Shane Ross. 2/20/2025–05/31/2026. $10,000.

2024 **SCHEV (State Council of Higher Education for Virginia) Award**, "Bullet-Time Imaging: 3D High-Speed Photogrammetry" PI: J. Socha, Co-PI S. Ross. $50,000 for equipment.

2023 **ICTAS (Institute of Critical Technology and Applied Science) Diversity and Inclusion Seed Grant,** "Introducing concepts of comparative biomechanics and bio-inspired engineering to students of the Atlanta University Center Consortium" PI: J. Socha. Co-PI: E. Red (Morehouse College), 12/14/2023–06/30/2026. $20,000.

2022 **ICTAS (Institute of Critical Technology and Applied Science) EFO Seed Grant,** "A fundamental understanding of how snakes move using substrate-friction interactions" PI: H. Pendar, Co-PI: J. Socha. Co-PI: J. Rieser (Emory University), 10/29/2022–06/30/2023. $10,000.

2021 **ICTAS (Institute of Critical Technology and Applied Science) Diversity and Inclusion Seed Grant,** "Introducing concepts of comparative biomechanics and bio-inspired engineering to students of the Atlanta University Center Consortium" PI: J. Socha. Co-PI: E. Red (Morehouse College), 10/29/2021–06/30/2023. $20,000.

2021 **National Science Foundation IOS (Integrative Organismal Systems) Grant**, "Biomechanical constraints and trade-offs between sugar and blood feeding in mosquitoes" NSF IOS (2114127). PI: C. Lahondère, Co-PI: M. Stremler, Co-PI: J. Socha, Co-PI: C. Vinauger, 08/10/2021–08/9/2024. $1,031,547.

2020 **National Science Foundation PoLS (Physics of Living Systems) Grant**, "The role of hydrodynamic slip in insect respiration" NSF PoLS (2014181). PI: A. Staples, Co-PI: J. Socha, 09/1/2020–08/31/2023. $449,999.

2020 **National Science Foundation CBET (Chemical, Bioengineering, Environmental and Transport Systems) Fluid Dynamics Grant**, "Flying snakes: the fluid mechanics of deforming articulated bodies" NSF CBET (2027523; co-funded by IOS). PI: S. Ross, Co-PI's: J. Socha, P. Vlachos (Purdue), H. Dong (UVA), 08/1/2020–07/31/2023. $639,919.

2019 **Virginia Space Grant Consortium Grant,** "Mechanisms of interfacial locomotion in the Indian skipper frog" PI: J. Socha, 05/10/2019–05/09/2020. $6,000 (Fellowship for support of Ph.D. student Talia Weiss.)

2018 **ICTAS (Institute of Critical Technology and Applied Science) Diversity and Inclusion Seed Grant,** PI: J. Socha. Co-PI: E. Red (Morehouse College), 10/2/2018–06/30/2018. $10,000.

2018 **ICTAS (Institute of Critical Technology and Applied Science) REU Grant,** "Optimum slithering and digging of elongate organisms in granular media" PI: H. Pendar, Co-PI's: J. Socha, J. Chung, S. Jung. 10/2/2018–06/30/2018. $10,000.

2018 **National Science Foundation MRI (Major Research Instrumentation) Grant**, "MRI: Development of a system for high-resolution uninterrupted capture of complex animal motions" NSF CMMI (1828280). PI: R. Mueller, Co-PI's: H. Zhu, A. Leonessa, J. Socha, A. Abbott. 10/1/2018–9/30/2019. $249,666.

2018 **National Science Foundation PFBP (Postdoctoral Fellowships for Broadening Participation in Biology) award**, "Circulatory flow in insect wings" Fellowship awarded to Mary Salcedo (Ph.D., Harvard University) for 2 years of postdoctoral research in my lab, 3/1/19–3/1/21. $138,000.

2018 **Virginia Space Grant Consortium Grant,** "Mechanisms of interfacial locomotion in the Indian skipper frog" PI: J. Socha, 05/10/2018–05/09/2019. $6,000 (Fellowship for support of Ph.D. student Talia Weiss.)

2017 **ICTAS (Institute of Critical Technology and Applied Science) Diversity and Inclusion Seed Grant,** PI: J. Socha. Co-PI: W. Rockward (Morehouse College), 10/1/2017–06/30/2017. $10,000.

2016 **Virginia Space Grant Consortium Grant,** "The shape of a flying snake: extracting aerodynamics for insight on unconventional aircraft design" PI: J. Socha, 05/10/2016–05/09/2017. $8,500 (Fellowship for support of undergraduate Alex McLean.)

2016 **ICTAS (Institute of Critical Technology and Applied Science) Diversity and Inclusion Seed Grant,** PI: J. Socha. Co-PI: W. Rockward (Morehouse College), 10/20/2016–06/30/2017. $10,000.

2016 **National Science Foundation IOS (Integrative Organismal Systems) Grant**, "A new hypothesis for cardio-respiratory mechanics in insects" NSF IOS (1558052). PI: J. Socha, Co-PI's: J. Harrison (ASU), L. Miller (UNC), H. Pendar. 1/1/2016–4/30/2019. $869,059.

2015 **ICAT SEAD (Institute for Creativity, Arts, and Technology; Science, Engineering, Art, and Design) Grant**, "Determining the three-dimensional kinematics of flying snakes during aerial gliding" PI: J. Socha, Co-PI: S. Ross. 1/1/2015–4/30/2015. $3,000.

2014 **National Science Foundation CAREER Grant**, "Gliding flight in snakes: How wingless gliders produce force, maintain stability, and maneuver" NSF PHY (1351322), PoLS (Physics of Living Systems). PI: J. Socha. 9/1/2014–8/31/2019. $750,000.

2014 **National Science Foundation PFBP (Postdoctoral Fellowships for Broadening Participation in Biology) award**, "Sensorimotor control in aerodynamic forces of gliding snakes " Fellowship awarded to Sharri Zamore (Ph.D., U. Washington) for 3 years of postdoctoral research in my lab, 9/1/15–9/1/18. $207,000.

2014 **Virginia Space Grant Consortium Grant,** "Investigating flows in insect hearts as inspiration for microfluidic pumps" PI: J. Socha, 05/15/2014–05/14/2015. $5,000 (Fellowship for support of Ph.D. student Matt Giarra.)

2014 **Virginia Tech COE (College of Engineering) Award,** "Dean's Office Incentive Graduate Positions 2014-15", PI: J. Socha. Funded GRA position for 2 semesters, 2014-15, PI: J. Socha, $41,728.28.

2013 **National Science Foundation RET (Research Experiences for Teachers) Grant**, "RET in Engineering and Computer Science Site: Biomechanics from molecular to organismal scales" NSF EEC (1301037), PI: J. Socha. (Originally awarded with D. Dudek.) 1/1/2014–12/31/2016. $499,670.

2013 **National Science Foundation GV (Graphics and Visualization) Grant**, "HCC: Small: Collaborative Research: Immersive visualization and 3D interaction for volume data analysis" NSF IIS (1320046), PI: D. Bowman, Co-PI's: J. Socha, D. Laidlaw. 6/1/2013–5/31/2016. $249,946.

2013 **National Science Foundation EFRI-REM (Emerging Frontiers in Research and Innovation, Research Experience and Mentoring) Grant**, "Complex microsystem networks inspired by internal insect physiology" NSF ENG supplement to award 0938047, PI: J. Socha. Co-PI's: R. Davalos, I Puri. 6/1/2013–5/31/2014. $114,988.

2013 **National Science Foundation PoLS (Physics of Living Systems) Grant**, "How do animals harness water entry and exit dynamics? " NSF PHY (1205642), PI: S. Jung. Co-PI's: J. Socha, P. Vlachos. 2/15/2013–2/14/2016. $510,436.

2013 **Virginia Tech COE (College of Engineering) Engineering Fee Allocation,** "A Planar Biaxial Testing System to Incorporate Hands-on Activities in the ESM Curriculum" PI: M. Al-Haik, Co-PI's: S. Case, R. De Vita, D. Dillard, D. Dudek, J. Socha. $250,020.

2012 **National Science Foundation IDBR (Instrument Development for Biological Research) Grant**, "IDBR: Instrument development for three-dimensional fluid flow measurements of freely-flying animals" NSF BIO (1152304), PI: P. Vlachos. Co-PI's: T. Hedrick (UNC), J. Socha. 7/1/2012–6/30/2015. $599,968.

2012 **National Science Foundation EFRI-REM (Emerging Frontiers in Research and Innovation, Research Experience and Mentoring) Grant**, "Complex microsystem networks inspired by internal insect physiology" Competitive outreach supplement to award NSF EFRI 0938047 0938047, PI: J. Socha. Co-PI's: R. Davalos, I Puri. 6/1/2012–5/31/2013. $100,000.

2010 **DARPA Grant**, "Fundamental mechanics of gliding flight in snakes" PI: J. Socha. Co-PI: P. Vlachos. 3/1/2010–11/30/2010. $331,904.

2010 **National Science Foundation EFRI (Emerging Frontiers in Research and Innovation) Grant**, "Complex microsystem networks inspired by internal insect physiology" NSF ENG (0938047), PI: J. Socha. Co-PI's: J. Harrison, R. De Vita, R. Davalos, A. Staples. 1/1/2010–12/31/2013. $1,992,607.

2009 **ICTAS (Institute of Critical Technology and Applied Science) Grand Challenges Grant**, "Biomimetic microsystems inspired by physiological networks in insects" PI: J. Socha. Co-PI's: M. Agah, R. De Vita, R. Davalos, I. Puri, S. Ross, A. Staples, M. Stremler, P. Vlachos. 7/1/2009–6/30/2012. $298,466.

2009 **The Thomas F & Kate Miller Jeffress Memorial Trust Grant**, "The biomechanics of compressible tracheal networks in insects" PI: J. Socha. 7/1/09–6/30/10. $21,000.

2009 **Virginia Tech COE (College of Engineering) Engineering Fee Allocation**, "A Multi-camera High-speed Video System for Undergraduate Education and Research Experience", PI: J. Socha, Co-PI's: R. De Vita, D. Dudek, M. Hajj, M. Paretti, M. Stremler, Sunny Jung, $89,700.

Awards prior to Virginia Tech

2000 **National Geographic Committee for Research and Exploration Grant**

2000 **The Journal of Experimental Biology Traveling Fund Grant**

2000 **Hinds Fund Grant** (University of Chicago)

2000 **The Explorers Club Exploration Fund Grant**

2000 **Sigma Xi Grant-in-Aid-of-Research**

2000 **Chicago Herpetological Society Grant**

1997 **Hinds Fund Grant** (University of Chicago)

1997 **Sigma Xi Grant-in-Aid-of-Research**

1995 **Goals 2000 High School Improvement Grant**, St. Mary Parish (La.) Schools

1993 **Howard Hughes Undergraduate Research Grant**, Duke University

Teaching Experience

Primary teaching posts

2014-present **Professor**, Virginia Tech. Courses taught: ESM 4105: Engineering Analysis of Physiologic Systems I; ESM 4106: Engineering Analysis of Physiologic Systems II; ESM 4245/5245: Mechanics of Animal Locomotion (Terrestrial), ESM 4246/5246: Mechanics of Animal Locomotion (Fluids), ESM 5004: Scientific Communication in Engineering Mechanics; GRAD 5134: Interdisciplinary Research at the Engineering-Biology Interface; ESM 5944: Seminar.

2014-present **Associate professor**, Virginia Tech. Courses taught: ESM 2104: Statics; ESM 4105: Engineering Analysis of Physiologic Systems I; ESM 4106: Engineering Analysis of Physiologic Systems II; ESM 5405/6: Biomedical Engineering Clinical Internship; ESM 4245/5245: Mechanics of Animal Locomotion (Terrestrial), ESM 4246/5246: Mechanics of Animal Locomotion (Fluids), ESM 5004: Scientific Communication in Engineering Mechanics; GRAD 5134: Interdisciplinary Research at the Engineering-Biology Interface.

2008-2014 **Assistant professor**, Virginia Tech. Courses taught: ESM 2104: Statics; ESM 4105: Engineering Analysis of Physiologic Systems I; ESM 4106: Engineering Analysis of Physiologic Systems II; ESM 5405/6: Biomedical Engineering Clinical Internship; ESM 4984/5984: Biomotion: Life in Moving Fluids (special study), ESM 4246/5246: Mechanics of Animal Locomotion.

2004, 07, 08 **Lecturer**, University of Chicago. Bio-Sci 112: Animal Locomotion. Responsible for design and teaching of new course for non-majors. Enrollment: 44-47 undergraduate students.

2007, 2008 **Lecturer**, University of Chicago. Bio-Sci 243: From Neurons to Behavior: The Morphological and Physiological Basis of Movement. Co-taught with prof. Melina Hale.

2003 **Assistant Lecturer**, University of Chicago. Bio-Sci 184: Biological Diversity, prof. Michael LaBarbera. Responsible (along with co-lecturer) for setup, implementation, and instruction of weekly labs for 89 students.

1997-1999 **Course Instructor**, University of Chicago, Bio-Sci 500: Teaching Assistant Training Class. Taught biological sciences graduate students university-level pedagogical methods. Initiated and successfully completed a major redesign of course in 1998.

1994-1996 **Science Department Head and Teacher**, Centerville High School, Centerville, La. Courses taught: Biology, Physics, Chemistry, Computer Science, and Physical Science.

1994-1996 **Corps Member**, Teach for America national teacher corps.

Mentorship

Current graduate students:

Jeffrey Anderson, Biological Sciences, PhD expected 2026 (co-advisor: Ignacio Moore)

Yohan Sequeira, Engineering Mechanics, PhD expected 2028 (co-advised BIOTRANS student; secondary advisor: Shane Ross)

Saadbin Khan, Engineering Mechanics, PhD expected 2026 (co-advised BIOTRANS student; primary advisor: Anne Staples)

Amado Al-Doori, Engineering Mechanics, PhD expected 2030 (co-advised BIOTRANS student; secondary advisor: TBD)

Jacob Sobol, Biological Sciences, MS expected 2026 (co-advisor: Ignacio Moore)

MJ Bishoff, Mechanical Engineering, MS expected 2027 (co-advised BIOTRANS student; secondary advisor: TBD)

Akshat Prem, Mechanical Engineering, MS expected 2027.

Previous graduate students:

PhD:

Joshua Pulliam, Engineering Mechanics, PhD 2025. Dissertation title: "Bridging the gap: Biomechanics of vertical gap-crossing in snakes and cicadas."

Talia Weiss, Engineering Mechanics, PhD 2022 (IGERT student). Dissertation title: "Locomotion of skittering frogs at the air-water interface."

Roderick La Foy, ME, Ph.D. 2022 (IGERT student). Dissertation title: "Three-dimensional fluid flow measurement techniques with applications to biological flows."

Mal Graham, Engineering Mechanics, Ph.D. 2022, Dissertation title: "Dynamic gap-crossing movements in jumping and flying snakes."

Joel Garrett, Biomedical Engineering, Ph.D. 2020 (IGERT student; co-advised with Rafael Davalos), Dissertation title: "Microfluidic flow in the insect respiratory system."

Jack Whitehead, Biological Sciences, Ph.D. 2019 (IGERT student; co-advised with Ignacio Moore), Dissertation title: "An examination of the kinematics and behavior of Mallards (*Anas platyrhynchos*) during water landings."

Khaled Adjerid, Engineering Mechanics, Ph.D. 2019 (IGERT student; co-advised with Raffaella De Vita), Dissertation title: "Biomechanics of tracheal compression in darkling beetles"; currently a postdoctoral researcher at Northeast Ohio Medical University, working with Dr. Rebecca German.

Melissa Kenny, Biomedical Engineering, Ph.D. 2019 (IGERT student; co-advised with Mark Stremler), Dissertation title: "Structural and physical characterization of insect flow systems"; currently an Assistant Teaching Professor in the Department of Engineering, Wake Forest University.

Isaac Yeaton, Mechanical Engineering, Ph.D. 2018 (IGERT student; co-advised with Shane Ross), Dissertation title: "The dynamics of non-equilibrium gliding in flying snakes"; currently employed by the Advanced Physics Laboratory, Johns Hopkins University.

Matthew Giarra, Mechanical Engineering, Ph.D. 2017 (co-advised with Pavlos Vlachos), Dissertation title: "The signal in the noise: Understanding and mitigating decorrelation in particle image velocimetry"; currently employed by the Advanced Physics Laboratory, Johns Hopkins University.

Farid Jafari, Engineering Mechanics, Ph.D. 2016, Dissertation title: "Physical mechanisms of control of gliding in flying snakes"; currently employed as a visiting professor in Mechanical Engineering at Grand Valley State University.

Hodjat Pendar, Engineering Mechanics, Ph.D. 2014, Dissertation title: "The mechanical linkage of abdominal movements and the respiratory system in beetles"; currently employed as a research assistant professor in Biomedical Engineering and Mechanics at Virginia Tech.

Masters:

Marta Drabek, Aerospace Engineering (U. Glasgow), M.S., "Aerodynamics of chambers used for respiratory measurements at low Reynolds numbers in small animals", 2015

Catherine Twyman, Mechanical Engineering, M.E., "Landing without limbs: body shape during arboreal landings in flying snakes", 2015

Elan Dalton, Biological Sciences (NSF MultiSTEPS IGERT student; co-advised with Ignacio Moore), M.S., "The role of the abdominal pump in tracheal tube compression in the darkling beetle, *Zophobas morio*", 2013

Daniel Holden, Mechanical Engineering (co-advised with Pavlos Vlachos), M.S., "Flying snakes: Aerodynamics of body cross-sectional shape", 2011

Sarah Dellinger, Engineering Mechanics, M.S., "Material properties of skin in a flying snake (*Chrysopelea ornata*)", 2011

Lewis Cox, Engineering Mechanics, M.S., "Patterns of hemolymph pressure related to tracheal tube collapse in the beetle *Pterostichus commutabulis*", 2011

Committee membership:

M.S. Candidates - on Committee (17)

Completed (15)
Michael Sano (M.S., ESM, 2009)
Sreenath Balakrishnan (M.S., ME, 2010)
Brady Drew (M.S., ME, 2011)

Navish Wadhwa (M.S., ESM, 2012)
Ian Marcus (M.S., ESM, 2013)
Victor Stewart (M.S., BME 2013)
Leigh Allen (M.S., ESM 2014)
Winston Becker (M.S., ESM 2014)
Souvick Chatterjee (M.S., ESM 2015)
Candice Stefanic (M.S., Geosciences 2017)
Nicole Wynn (M.S., BEAM, 2020)
Jorjie Wilson (M.S., BEAM, 2023)
Tyana Scott (M.S., BEAM, 2023)
Danielle Njike (M.S., ME, 2025)
Yogesh Phalak (M.S., ME, 2025)

In Progress (2)
Alex Gioa (Ph.D., BEAM, expected 2026)
Everett Liggett (Ph.D., ME, expected 2027)

Ph.D. Candidates - on Committee (31)

Completed (26)
Brad Hendershot (Ph.D., SBES, 2012)
Joe Welker (Ph.D., ESM 2012)
Yasser Aboelkassem (Ph.D., ESM, 2012)
Saikat Jana (Ph.D., ESM, 2013)
Suvojit Ghosh (Ph.D., ESM, 2013)
Mittu Pannala (Ph.D., ME, 2013)
Matthew Webster (Ph.D., ESM, 2014)
Dragan Avirovik (Ph.D., ME, 2014)
Sean Gart (Ph.D., BEAM, 2015)
Jeffrey Feaster (Ph.D., ME, 2017)
Brian Chang (Ph.D., BEAM, 2018)
Gary Nave (Ph.D., BEAM, 2018)
Krishnasis Chatterjee (Ph.D., BEAM, 2018)
Gregory Krummel (Ph.D., ME, 2018)
Colin Stewart (Ph.D., ME, 2019)
Alex Peebles (Ph.D., BEAM, 2020)
Cherice Hughes-Oliver (Ph.D., BEAM, 2020)
Xiaoyan Yin, (Ph.D., ME, 2020)
Peter Windes (Ph.D., ME, 2020)
Pranav Khandelwal (Ph.D., Biology, UNC, 2021)
Hyunggon Park (Ph.D., BEAM, 2022)
Olivier Mesnard (Ph.D., Mechanical and Aerospace Engineering, George Washington U., 2022)
Hongshun Chen (Ph.D., ME, 2023)
Michael Teater (Ph.D., BEAM, 2023)
Amanda Hashimoto (Ph.D., ME, 2025)
Eighdi Jung (Ph.D., ME, 2025)

In Progress (6)
Angel Collins (Ph.D., ME, expected 2027)
Shuyu Zhang (Ph.D., ME, expected 2027)
Bokun Zheng (Ph.D., ME, expected 2027)
Calvin Riiska (Ph.D., Physics, Emory University, expected 2026)
Pranjal Anand (Ph.D., ME, Purdue University, expected 2027)
Ben Darden (Ph.D., AEO, expected 2028)

Research mentorships: undergraduates (at Virginia Tech)

2008-2009 (1)

Matt Means (ME, Bucknell), Jennifer Tolley (ESM), Sarah Bonham (ESM), Chad Olenick (ESM)

2009-2010 (4)

Steven Robinson (ESM), Jennifer Tolley (ESM), Sarah Bonham (ESM), Chad Olenick (ESM)

2010-2011 (8)

Steven Robinson (ESM), Rebecca Zapata (ESM), Carolyn Roberts (ESM), Sam Hochgraf (ESM), Danielle Beringer (ESM), Arielle Strong (ESM), Tara Cozier (ESM), Ruben Gameros (Aero, ASU)

2011-2012 (6)

Danielle Beringer (ESM), Ruben Gameros (Aero, ASU), Rebecca Zapata (ESM), Sam Hochgraf (ESM), Carolyn Roberts (ESM), Logan Miller (ESM)

2012-2013 (4)

Carolyn Roberts (ESM), Jessica Aviles (ESM), Logan Miller (ESM), Jacob Sieve (Chem Eng)

2013-2014 (3)

Jessica Aviles (ESM), Patrick Rogers (ESM), Jacob Sieve (Chem Eng)

2014-2015 (11)

Jessica Aviles (ESM), Patrick Rogers (ESM), Jacob Sieve (Chem Eng), Rochelle Silverman (Phy), Nadezda Makarova (ME), William Rosser (Bio), Grant Baumgardner (ME), Brittany Horton (Gen Eng), Sophie Behrend (Gen Eng), Alina Voelker (Gen Eng), Ngoze Nwoki (ESM)

2015-2016 (12)

Patrick Rogers (ESM), Jacob Sieve (Chem Eng), Rochelle Silverman (Phy), William Rosser (Bio), Grant Baumgardner (ME), Brittany Horton (Gen Eng), Sophie Behrend (Gen Eng), Alina Voelker (Gen Eng), Ngoze Nwoki (Physics), Alex McLean (Aero), Jeffrey Basoah (ME), Rhea Kapania (Nanomedicine)

2016-2017 (17)

Grant Baumgardner (ME), Brittany Horton (ME), Sophie Behrend (Gen Eng), Lauren Bochiccio (BSE, Phy, & Neuro), Ngoze Nwoki (Physics), Alex McLean (Aero), Jeffrey Basoah (ME), Yudi Ko (ME), Zackory Biggers (ME), Corey Spohn (ESM), Katherine Johnston (ME), Bryan Bergen (ME), Alok Baral (Bio), Melynna Thai (Aero), Rohan Bardhan (Aero), Caroline Schenewald (ME), Juel Hayes (Gen Eng)

2017-2018 (28)

Rohan Bardhan (Aero), Lauren Bochicchio (BSE, Phy, & Neuro), Ngoze Nwoki (Physics), Alex McLean (Aero), Zackory Biggers (ME), Alok Baral (Bio), Caroline Schoenewald (ME), Sofie Saunier (Gen Eng), Morgan Newcomb (Gen Eng), Amanda Butynes (Aero), Terrell Worrell (Gen Eng), Suinda Ossenkopp (Gen Eng), Anusha Balani (Chem), Mela Coffey (ESM), Michelle Prisbe (ME), Madeline Urso (ME), Tom Otgonbayar (Comp Eng), Antara Sahay (ME), Caroline Marti (Microbio), Jordan Proctor (Animal & Poultry Sci), Hanna Kiryluk (Animal & Poultry Sci), Natalie Lovelace (Animal & Poultry Sci), Lakirah Walker (Spelman College), Jonas Scherer (Westfälische Hochschule, Germany), Christie Crandall (ESM), Parker Broadnax (Applied Physics, Morehouse College), Ira Moore (Applied Physics, Morehouse College), Emily Graziani (ME)

2018-2019 (26)

Caroline Schoenewald (ME), Sofie Saunier, Gen Eng), Morgan Newcomb (Gen Eng), Amanda Butynes, Aero), Terrell Worrell (ESM), Suinda Ossenkopp, Gen Eng), Anusha Balani (Chem), Mela Coffey, ESM), Michelle Prisbe (ME), Madeline Urso (ME), Antara Sahay (ME), Caroline Marti, Microbio), Jordan Proctor (Animal & Poultry Sci), Hanna Kiryluk, Animal & Poultry Sci), Natalie Lovelace (Animal & Poultry Sci), Christie Crandall (ESM), Parker Broadnax (Applied Physics (Morehouse College)), Ira Moore, Applied Physics (Morehouse College) (Emily Graziani, ME), Nicole Araujo (Biological Sciences), Cassandra Basham, ME), Mariam Hasan (Gen. Eng.), Evelyn Jens, ME), Dina Liacopoulos (Gen. eng.), Brennan Rausch, ME), Abdul Shahid (Gen. Eng.)

2019-2020 (18)

Terrell Worrell (ESM), Mela Coffey (ESM), Caroline Marti (Microbio), Jordan Proctor (Animal & Poultry Sci), Natalie Lovelace (Animal & Poultry Sci), Donovan Hardy (Chemistry (Morehouse College)), Nicole Araujo (Biological Sciences), Brennan Rausch (ME), Zaid Salameh (ESM), Kyle Kinskie (Gen. Eng.), Mohamed Hussein (Gen. Eng.), Yulia Kirina (Gen. Eng.), Joyce Lu (Animal & Poultry Sciences), Camryn McClosky (Animal & Poultry Sciences), Noah Goldfarb (Animal & Poultry Sciences), Brisa Salas (Animal & Poultry Sciences), Taylor Payne (Animal & Poultry Sciences

2020-2021 (15)

Terrell Worrell (ESM), Mela Coffey (ESM), Zaid Salameh (ESM), Mohamed Hussein (Gen. Eng.), Yulia Kirina (MSE), Tyler Ellis (AOE), Alison Henry (BME), Noah Goldfarb (Animal & Poultry Sciences), Joyce Lu (Animal & Poultry Sciences), Brisa Salas (Animal & Poultry Sciences), Taylor Payne (Animal & Poultry Sciences), Eric Giniger (ESM), Shuhan Wang (ESM), Steven Salazar (ESM), Emily Spitaleria (ESM)

2021-2022 (17)

Terrell Worrell (ESM), Noah Goldfarb (Animal & Poultry Sciences), Joyce Lu (Animal & Poultry Sciences), Brisa Salas (Animal & Poultry Sciences), Jack Stevens (ME), Jordan Britt (ME), Anna Ferrari (BME), Riley Bridges (ME), Giovanni Morris (AOE), Rachel Porter (BSE), Gabriel Solis (Animal & Poultry Sciences), Jack Hopson (Animal & Poultry Sciences), Carter Terry (ME), Sasha Zaslavsky (ME), Bailey Sisson (Biological Sciences), Zoe King (ME, Brown University), Sydney Haywood (Chem E, UMBC)

2022-2023 (15)

Gabriel Solis (Animal & Poultry Sciences), Jack Hopson (Animal & Poultry Sciences), Carter Terry (ME), Sasha Zaslavsky (ME), Neha Vashistha (Biological Sciences), Isha Devgan (CS), Brock Palm CS), Devyn Hopkins (CS), Collin Barnett (Biological Sciences), Akhila Wills (ME), Jenna Shackleford (BME), Mason Dooley (ME), Sydney Blacksten (ME), Kandis Ajyeman (CS), Kamau Braxton-Hall (Biological Sciences)

2023-2024 (18)

Gabriel Solis (Animal & Poultry Sciences), Carter Terry (ME), Sasha Zaslavsky (ME), Neha Vashistha (Biological Sciences), Isha Devgan (CS), Brock Palm CS), Devyn Hopkins (CS), Collin Barnett (Biological Sciences), Akhila Wills (ME), Sydney Blacksten (ME), Kandis Ajyeman (CS), Kamau Braxton-Hall (Biological Sciences), Makenna Moore (BME), Anvitha Ponnada (ME), Gabriel Durango (ME), Danielle Barkers-Woode (BME), Trevor Bryan II (Morehouse College), Alan Mach (Brown University)

2024-2025 (20)

Carter Terry (ME), Collin Barnett (Biological Sciences), Akhila Wills (BEAM), Anvitha Ponnada (ME), Julia Alexander (Biological Sciences), Jessica Sot (ME), Kelly Fangyen (BEAM), Amalia Moore (UC Santa Barbara), Vicky Ji (ME), Madeline Potter (Wildlife Conservation), Nick Collins (Wildlife Conservation), Clay West (Enivornmental Science), Rin Chung (Biochemistry), Svanik Gaddipati (ME), Adi Desi (BEAM), Caitlyn Celio (Art), Mira Yeoh (ME and Biological Sciences), Leon Chen (ME), Niya McWhirter (physics, Spelman College), Evan Daniel (ME, UVA).

Research mentorships: public school teachers and high school students

2025 Isaak Wisnoiski, high school student, Blacksburg High School. Research project: Gliding in flying squid.

2023 Scarlett Ewing, high school student, Blacksburg High School. Research project: Feeding in arboreal snakes.

2023 Amalia Moore, high school student, Blacksburg High School. Research project: swimming in aquatic caterpillars.

2022-3 Beckett Socha, high school student, Blacksburg High School. Research project: Tongue sticking in arboreal snakes, swimming in aquatic caterpillars, snake jumping.

2019 Nitika Sood, high school teacher, Pulaski High School. Research project: Imaging of insect tracheal tubes using atomic force microscopy and SEM.

2019 Isaac McPherson, high school student, Blacksburg High School. Research project: Analysis of insect tracheal tubes using synchrotron x-ray imaging.

2018 Nitika Sood, high school teacher, Pulaski High School. Research project: Imaging of insect tracheal tubes using atomic force microscopy and SEM.

2018 Michael Collver, high school teacher, Blacksburg High School. Research project: Development of a virtual reality arena for the study of vision in flying snakes.

2017 Nitika Sood, high school teacher, Pulaski High School. Research project: Measuring variation in stiffness of insect tracheal tubes using atomic force microscopy.

2017 Phil Hernandez, high school teacher, William Fleming High School. Research project: Tongue-sticking: A non-oscillatory tongue-flick in flying snakes.

2016 Amanda Barnes, middle school teacher, James Breckenridge Middle School. Research project: How does temperature affect insect hemolymph? A study of the larvae of *Manduca sexta*.

2015 Pam Tegelman-Malabad, high school teacher, Giles High School. Research project: Morphology of the dorsal vessel of the darkling beetle *Zophobas morio*.

2015 Dawn Hakkenberg, high school teacher, Patrick Henry High School. Research project: Does foot curvature assist the Indian skipper frog (*Euphlcytis cyanophlyctis*) in jumping on water?

2014 Stephen Kamanda, high school teacher, North Stafford High School. Research project: Puncture, pump, and suck: How does the brown marmorated stink bug actually feed?

2013 Tiffany Hunter, high school teacher, Courtland High School. Research project: Determination of hemolymph volume in darkling beetles (*Zophobas morio*) using the isotope dilution technique.

2013 Alexis Johnston, high school senior, North Stafford High School. Research project: Spiracle opening patterns correlated to patterns of abdominal pumping in hissing cockroaches.

2012 Marquice Barnett, high school science teacher, Northern Guilford High School. Research project: the abdominal pump in the beetle *Zophobas morio*.

2012 Krishan Puri, high school senior, Blacksburg High School. Research project: stress effects of experimentation on locusts.

2012 Ellen Granata, high school junior, Blacksburg High School and Roanoke Valley Governor's School for Science and Technology. Research project: determination of viscosity of insect hemolymph.

Research mentorships: undergraduates and high school students prior to Virginia Tech

2008 Elizabeth Lee, first-year biology major, University of Chicago. Summer research project: 3-D rendering of *Drosophila melanogaster* tracheal system through development. (Supported by NSF grant 0834237 to Deborah Hoshizaki, NIH.) (Also continued in summer 2009.)

2007 John Sheppard, first-year biomedical engineering major, Northwestern University. Summer research project: 3-D rendering of *Pieris rapae* digestive system.

2007 You Zhou, first-year biology major, University of Chicago. Summer research project: 3-D rendering of *Drosophila melanogaster* tracheal system.

2006 Dexter Rietman, high school student, who earned a summer internship from winning the Chicago Public Schools Science Fair. Project: 3D reconstruction of insect tracheal systems using synchrotron microtomography.

2005 Jesse London, fourth-year physics major, University of Chicago. Summer research project: Fluid dynamics and function of tracheal compression in insects.

2005 Alyssa Winans, junior, Illinois Math and Science Academy (High School). Project: Body dynamics of a click beetle's click.

2004-06 Kevin Miklasz, Third and fourth-year physics major, University of Chicago. Projects: Fine-scale kinematics of glide-phase flight in a flying snake (*Chrysopelea paradisi*), Senior honors thesis: Determining the aerodynamic coefficients of flying snakes. Entered graduate school Fall 2006 working with Dr. Mark Denny, Stanford University.

2004-05 James Waters, fourth-year mathematics major, University of Chicago. Project: Tracheal compression patterns involved in gas exchange in the ground beetle, *Platynus decentis.* Entered graduate school Fall 2006 working with Dr. Jon Harrison, Arizona State University.

Graduate teaching assistant posts (University of Chicago)

2003 Bio-Sci 342: Biological Fluid Mechanics (also, *guest lecturer*)

2001 Bio-Sci 254: Biomechanics of Organisms (also, *guest lecturer*)

2000 Bio-Sci 294: Ecology, Genetics, and Evolution

1998 Bio-Sci 184: Biological Diversity

1997 Bio-Sci 238: Introduction to Invertebrate Biology

Professional & Service Activities

Internal service (Virginia Tech)

Member, ME Faculty Search Committee for Experimental Fluid Mechanics (2025-26)

ME Digital Accessibility Representative (2025-present)

Member, ME Honorifics Committee (2025)

Member, ME Promotion and Tenure Committee (2025-27)

Member, ME Faculty Search Committee for Intelligence Embodiment and Learning in Robotics (2024-25)

Chair, Engineering Mechanics Memorial Lecture Committee (2024-present)

Member, Engineering Mechanics Graduate Student Committee (2008-present)

Member, BEAM Honorifics Committee (2023-24)

Member, BEAM Promotion and Tenure Committee (2020-24)

Member, BEAM Memorial Lecture Committee (2019-24)

Chair, BEAM Diversity Committee (2018-19, 2021-22)

Member, College of Engineering Diversity Committee (2018-19, 2021-22)

Member, BEAM Diversity Committee (2017-18)

Director, BIOTRANS IGEP (Biological Transport Interdisciplinary Graduate Education Program), (2017-22)

Co-Director, BIOTRANS IGEP (Biological Transport Interdisciplinary Graduate Education Program), (2016-17, 2022-23)

Member, Mechanical Engineering Faculty Search Committee (2015-16)

Member, Industrial Systems Engineering Faculty Search Committee (2015-16)

Chair, BEAM Faculty Search Committee (2014-15)

Member, BME-ESM Transition Committee (2014)

Workshop organizer, *Amerimech 2012: Mechanics in Biology*

Member, ESM Executive Committee (2009-2012)

Member, ESM Laboratory Committee (2008-2014)

Member, ESM Librescu/Granata Memorial Lecture Series Committee (2008-09)

External service

Division of Comparative Biomechanics Chair, SICB, elected position, (Elect term: 2025-2027, Full term 2027-2029)

Chair, SICB Membership Committee, Society for Integreative and Comparative Biology(2025-present)

Member, SICB Membership Committee, Society for Integreative and Comparative Biology(2024-2025)

Program Officer, SICB, elected position, (2020-2022)

Program Officer-Elect, SICB, elected position, (2018-2020)

Program Officer, SICB DCB (Division of Comparative Biomechanics), elected position, (2016-18)

Chair, Ad-hoc committee on fate of SICB students (2015-16)

Editor, SICB Press releases (2015-16)

Editor (and founder), SICB Student Journalism Program (2012-2016)

Chair, SICB DCB (Division of Comparative Biomechanics) Best Student Paper program (2011-2016)

Chair, Society for Integrative and Comparative Biology (SICB) Public Affairs Committee (2010-14)

Conference organizer, Southeast Regional SICB Meeting of DCB/DVM at Virginia Tech (2010, 2017, 2023)

Member, SICB Public Affairs Committee (2009-10, 2015)

Symposium organizer, *Insights from synchrotron x-ray imaging and beyond: mechanisms and regulation of flow generation in tracheal systems*. International Congress of Respiratory Science 2009, Bonn, Germany.

Panel proposal participant for National Science Foundation (2009, 2013, 2016, 2017, 2019, 2023, 2024)

Ad-hoc reviewer for National Science Foundation panels (2013, 2016, 2017, 2020, 2023)

Member of the FXI Beamline Advisory Team (BAT) at the NSLS (National Synchrotron Light Source), Brookhaven National Laboratory (2011-2014)

Professional Membership

American Association for the Advancement of Science (AAAS)

American Physical Society (APS)

Society for Integrative and Comparative Biology (SICB)

Editorial and Referee Service

Editorial Board member, Biology Letters (2024-present)

Editorial Advisory Board member, Journal of Experimental Biology (2023-present)

Associate Editor, Royal Society Open Science (2017-2022)

Review Editor, Frontiers in Invertebrate Physiology (2010-22)

Ad-hoc reviewer for the following journals (60): Acta Biomaterialia, AIAA Journal, American Naturalist, American Museum Novitates, Arthropod Structure and Development, Bioinspiration and Biomimetics, Biological Journal of the Linnean Society, Biology Letters, Biomimetics, Biotropica, BMC Computational Biology, BMC Ecology & Evolution, Current Biology, European Radiology, Frontiers in Invertebrate Physiology, Frontiers in Physiology, Functional Ecology, eLife, Entomologia Experimentalis et Applicata, European Physical Journal Special Topics, Fluids, Invertebrate Biology, Insect Science, Herpetologica, Herpetological Review, Integrative and Comparative Biology, Integrative Organismal Biology, Journal of Anatomy, Journal of Bionic Engineering, Journal of Biosciences, Journal of Comparative Physiology Part-A, Journal of Ethology, Journal of Experimental Biology, Journal of Experimental Zoology, Part-A: Comparative Experimental Biology, Journal of Insect Physiology, Journal of Medical Entomology, Journal of Theoretical Biology, Journal of the Mechanical Behavior of Biomedical Materials, Journal of the Royal Society Interface, Journal of Zoology, MCZ Brevoria, Microscopy Research and Technique, Museum of Comparative Zoology, Nature, Nature Communications, Phyllomedusa, Physiology, Physics of Fluids, PLoS Biology, PLoS ONE, Polymer Composites, Proceedings of the Royal Society B, Psyche, Reptiles & Amphibians, Royal Society Open Science, Science, Science Advances, Science Robotics, Scientific Reports, Zoology

Book reviewer, Princeton University Press (2018)

Presentations

Invited Presentations

2026 Flatiron Institute (Simons Foundation), Center for Computational Biology, Seminar: *From jumping to gliding in snakes*

2025 Carnegie Mellon University, Department of Mechanical Engineering Seminar: *Snakes that jump and fly*

2024 Biological Physics & Physical Biology (BPPB) Seminar series invited speaker: *The mechanics of snakes in flight*

2024 Virginia Tech CREATe (Center for Research and Engineering in Aero/Hydrodynamic Technologies) invited speaker: *Snakes that jump and glide*

2023 University of Maine School of Biology and Ecology Seminar: *What's up with flying snakes?*

2023 Advanced Characterization and Imaging Facility Workshop, Clemson University: *Synchrotron imaging of insects and other small animals*

2022 Virginia Tech Life Sciences Seminar (VTLSS): *What's up with flying snakes?*

2022 American Physiological Society, Comparative Physiology: From Organisms to Omics in an Uncertain World, Symposium on the Physiology of Tracheal Respiratory Systems: *Biomechanics of active ventilation via tracheal compression in insects*

2022 Clemson University, Department of Biology Seminar: *Biomechanical mechanisms of fluidic pumping in insects* (virtual)

2022 Brown University, Department of Mechanical Engineering Seminar: *How flying snakes glide: turning the body into a wiggling wing*

2021 University of Nebraska, Department of Mechanical Engineering Seminar: *Insights into tiny flow systems: how insects produce internal flows*

2021 Natural History Museum of Los Angeles County Seminar: *How flying snakes glide: turning the body into a wiggling wing* (virtual)

2021 Brown University, Department of Mechanical Engineering Seminar: *Insights into tiny flow systems: how insects produce internal flows* (virtual)

2021 Tübingen University, Institute for Evolution and Ecology Seminar: *Functional warping of cylinders in flying snakes and breathing bugs* (virtual)

2020 Pennsylvania State University, Department of Mechanical Engineering Seminar: *How flying snakes glide: turning the body into a wiggling wing* (virtual)

2020 University of British Columbia, Department of Zoology Seminar: *Functional warping of cylinders in flying snakes and breathing bugs* (virtual)

2020 University of Michigan, Department of Mechanical Engineering Seminar: *How flying snakes glide: turning the body into a wiggling wing* (virtual)

2020 Virginia Tech College of Engineering Alumni First Friday Webinar: *Jake Socha and the Flying Snakes* (virtual)

2019 2nd International Workshop on Insect Bio-inspired Microtechnology, Grenoble, France, Invited Speaker: *Biomechanical mechanisms of fluidic pumping in insects*

2019 Greater Virginia Branch of the American Association of Laboratory Animal Science (GVB AALAS), Virginia Tech, Guest Speaker: *The biomechanics of flying snakes*

2019 Lifelong Learning Institute (LLI) Guest Speaker for "Weird Animals You Should Love or at Least Appreciate" course, Virginia Tech: *How snakes move: from slithering to gliding*

2019 American Veterinary Medicine Association (AVMA) Annual Convention Plenary Lecture, Comparative Medicine Track: *The biomechanics of flying snakes*

2019 Morehouse College Department of Physics Seminar: *Comparative biomechanics in the Socha Lab: flying snakes, skittering frogs, and more*

2018 Vanderbilt University, Department of Biological Sciences Seminar: *Snakes that glide and mosquitoes that gulp*

2018 Virginia Tech MathBio Seminar, Department of Mathematics: *How butterflies and mosquitoes pump and suck (to drink)*

2018 University of Virginia, Mountain Lake Biological Station Seminar: *The biomechanics of flying snakes and breathing bugs*

2018 University of Illinois, Urbana-Champaign Department of Mechanical Science and Engineering Seminar: *Flying snakes, skittering frogs, and lapping dogs: an organismal biomechanics perspective*

2018 Morehouse College Department of Physics Seminar: *Comparative biomechanics in the Socha Lab: flying snakes, skittering frogs, breathing bugs, and tongues*

2017 Johns Hopkins Department of Mechanical Engineering Seminar: *Lapping dogs, skittering frogs, and insect blood: an organismal biomechanics perspective*

2016 Roanoke College Department of Biology Seminar: *Flying snakes, lapping dogs, and the biomechanics of other odd things*

2016 Morehouse College Department of Physics Seminar: *Flying snakes, lapping dogs, and the biomechanics of other odd things*

2016 National Centre for Biological Sciences (India) Seminar: *Bug guts and flying snakes: Biomechanics from the inside out*

2016 Longwood University Chichester Colloquium Seminar: *How to turn a snake into a wing*

2016 New Mexico State University Howard Hughes Seminar: *Bug guts and flying snakes: Biomechanics from the inside out*

2016 University of Virginia Mechanical Engineering Seminar: *How to turn a snake into a wing*

2015 Virginia Tech Institute for Creativity, Arts, and Technology Community Playdate Seminar: *Recent experiments on flying snake kinematics*

2015 University of Illinois, Urbana-Champaign Department of Mechanical Science and Engineering Seminar: *Internal beetle mania: How insects mechanically couple their physiological systems to produce flows*

2015 Physical Biology of Organisms Workshop Keynote: *Joy and pain: experiences in working with all types, from engineers to artists*

2015 Virginia Tech Institute for Creativity, Arts, and Technology Community Playdate Seminar: *How snakes fly*

2015 Wake Forest Department of Biology Seminar: *Gut check time: How insects produce internal flows using mechanical linkages*

2015 Full field Imaging and Complementary Techniques with the APS Upgrade Workshop, Argonne National Laboratory: *No guts, no glory: How X-rays reveal the link between the digestive and respiratory systems in insects*

2015 University of Chicago Ev-Morph Seminar: *Gut check time: How insects produce internal flows using mechanical linkages*

2014 Johns Hopkins University Mechanical Engineering Seminar: *How snakes fly: Effects of anatomy and behavior on the aerodynamics of a wingless glider*

2014 Invited speaker, 107th Annual Meeting of the German Zoological Society (DZG): *How snakes fly: Effects of morphology and behavior on performance*

2014 Keynote speaker, Greater Virginia Branch of the American Association of Laboratory Animal Science meeting: *Challenges of being a snake glider: How to turn a snake into a wing*

2014 University of North Carolina, Chapel Hill, Department of Mathematics Seminar: *One pump or two? The internal biomechanics of drinking in insects, and why it pays to suck*

2014 2014 APS/CNM/EMC Users Meeting Workshop: 4D Imaging Applications in Dynamic Studies: *How beetles induce tracheal collapse: A multi-linked system (cancelled due to airline problems)*

2013 University of Akron Department of Biology/Integrated Biosciences Program Seminar: *Flying snakes and pumping bugs: the biomechanics of fluid flows from within and without*

2013 Keynote speaker, Southeast Regional Society for Integrative and Comparative Biology Meeting: *Push, squeeze, and suck: How insects move fluids on the inside*

2012 Tedx Virginia Tech: *How snakes fly*

2012 Virginia Tech, AmeriMech 2012: *What can insects teach us about how to move fluids at the microscale?*

2012 Virginia Tech, 2nd Interdisciplinary Research (IDR) Symposium: *What can insects teach us about how to move fluids at the microscale?*

2012 Keynote speaker, Rocky Mountain Bioengineering Symposium: *Challenges of being a snake glider: How to turn a snake into a wing*

2010 Youngstown State University, Department of Biological Sciences Seminar: *Snakes aren't a plane: how flying snakes glide*

2010 Virginia Tech VaCAS (Virginia Center for Autonomous Systems) Seminar: *Flying snakes*.

2010 Shandong University - Virginia Tech Symposium on Bat Biophysics and Bio-Inspired Technology: *The biomechanics of gliding flight in snakes*.

2010 Virginia Tech, Department of Entomology Seminar: *Mechanics of convection in compressible tracheal structures in insects and dynamics of pumping in liquid feeders*

2009 Virginia Tech, Department of Biological Sciences Seminar: *Suck, pump, and squeeze: the biomechanics of insect internal flow systems*

2008 Tufts University, Department of Biology Seminar: *Fluid flows in insects: studies of breathing, feeding, and circulation using synchrotron x-ray imaging*

2008 University of Nevada, Las Vegas, School of Life Sciences Seminar: *Investigating internal fluid flows using x-rays: how insects suck, squeeze, and blow to feed and breathe*

2007 Technical University of Denmark, Department of Physics Colloquium: *From flying snakes to squeezing bugs: the biomechanics of locomotion, respiration, and feeding in animals that scurry, slither, and suck*

2007 Arizona State University, Department of Physics Colloquium: *Powerful x-rays, tiny bugs: how we use synchrotron radiation to study form and function in insects and other small critters*

2007 Undergraduate Summer Research Seminar Series (Argonne National Laboratory): *Powerful x-rays, tiny bugs: how we use synchrotron radiation to study form and function in insects and other small critters*

2007 DePaul University Department of Biological Sciences seminar: *Airflows in, out, and about: the biomechanics of how snakes glide and insects breathe*

2007 Virginia Tech Department of Engineering Science and Mechanics seminar: *From flying snakes to frying bugs: the biomechanics of locomotion, respiration, and feeding in animals that scurry, slither, and suck*

2006 Illinois Institute of Technology Physics Colloqium: *Powerful x-rays, tiny bugs: how we use synchrotron radiation to study form and function in insects and other small critters*

2006 Art Institute of Chicago: *The kinematics of flying snakes*

2006 University of Tuebingen Biology Seminar: *The power of synchrotron x-rays for the study of form and function in insects*

2006 Undergraduate Summer Research Seminar Series (Argonne National Laboratory): *Powerful x-rays, tiny bugs: how we use synchrotron radiation to study form and function in insects and other small critters*

2006 Illinois State University Physics Colloqium: *Bug zapping for adults: The use of synchrotron x-rays to study the physiology and biomechanics of insects*

2006 Truman State University Mathematical Biology Seminar: *The use of synchrotron x-rays for studies in organismal biology*

2006 University of Chicago Fishes Group Seminar: *Synchrotron microCT: 3D morphology of millimeter-scale anatomy with micron resolution*

2006 Guest speaker, Science Careers in Search of Women Conference (Argonne National Laboratory): *Life's essentials revealed: Breathing, eating, and mating (in the beam)*

2006 Guest speaker, Chicago Public Schools Science Fair Symposium: *The biomechanics of creepy crawlies*

2006 Argonne National Laboratory XFD Seminar: *Flying snake locomotion – How to jump, glide, and land with no legs*

2006 Argonne National Laboratory APS Users Seminar: *The role of tracheal compression in gas exchange in a beetle, Platynus decentis*

2006 University of Cincinnati Biological Sciences Seminar: *Flying snake locomotion – How to jump and glide if you have no legs*

2005 Keynote address, Argonne Symposium for Undergraduates in Science, Engineering and Mathematics

2005 Undergraduate Summer Research Seminar Series (Argonne National Laboratory): *Life's Essentials Revealed: Breathing, Eating, and Mating (in the beam)*

2005 Guest speaker, Science Careers in Search of Women Conference (Argonne National Laboratory): *How to convince a snake to fly, and other struggles of doing biological research*

2004 Guest speaker, National School on Neutron and X-ray Scattering Banquet: *Snakes, flight, and National Geographic Television*

2004 Ancient Giants Seminar: *Vertebrate design for locomotion: how the parts make the beast go*. For Chicago Public teachers, sponsored by Project Exploration.

2003 Clemson University Biology Seminar: *No wings required: The kinematics of gliding flight in a 'flying' snake*

2003 Duke University Biology Seminar: *No wings required: The kinematics of gliding flight in a 'flying' snake*

2003 Field Museum (Chicago): *How gliders glide*. For Chicago Public School teachers.

2003 Field Museum (Chicago): *Flight and insect diversity*. For Chicago Public School teachers.

2002 NASA, Ames (California): *Aerodynamics/Dynamics of Flying Snakes*

2002 University of California, Berkeley Integrative Biology Seminar: *Jump, dive, and glide – how 'flying' snakes get around*

2002 Illinois Institute of Technology Fluids Seminar: *Flying snakes – the world's most unlikely gliders*

2002 University of Chicago Natural History Seminar: *In search of the wiley flying snake*

2001 Chicago Public Schools Science Fair, Symposium Luncheon Guest Speaker: *Doing resesarch in the field*

2000 Chicago Herpetological Society: *Flying snake biomechanics – fun with fearless flyers*

2000 University of Chicago Evolutionary Morphology Seminar Series: *Flying snake 'flight': aerial acrobatics*

Conference Presentations

2026 Zakaria, M.A.*, C.A. Woolsey, P.C. Khandelwal, J.J. Socha, S.D. Ross. Side forces in gliding flight of *Draco* lizards. Talk presented at the AIAA SCITECH 2026 Forum, Big Sky, Montana.

2025 Sobol, J.*, Y. Sequeira*, M.L. Vandenberg*, C.M. Donatelli, J.J. Socha. A kink in the armor: Effects of an S-shaped posture on the fast-start response in juvenile poachers. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Portland, OR.

2025 Sequeira, Y.*, S. Gaddipati*, J. Sobol*, P. Khandelwal*, V. Gomez-Bahamon*, C. Caciedo*, P.R. Stevenson*, S. Ross, J.J. Socha. Falling with a spin: the dynamic flight of *Entada* seed capsules. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Portland, OR.

2025 Taylor, J.R.*, Anderson, J.A.*, Pulliam*, J.N., J.J. Socha. From branch to air: advancing our understanding of axial twist in flying snakes. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Portland, OR.

2025 Sobol, J.*, Y. Sequeira*, M.L. Vandenberg*, C.M. Donatelli, J.J. Socha. A kink in the armor: Effects of an S-shaped posture on the fast-start response in juvenile poachers. Talk presented at the Southeast Regional SICB Meeting at Clemson University.

2025 Sequeira, Y.*, S. Gaddipati*, J. Sobol*, P. Khandelwal*, V. Gomez-Bahamon*, C. Caciedo*, P.R. Stevenson*, S. Ross, J.J. Socha. Falling with a spin: the dynamic flight of *Entada* seed capsules. Poster presented at the Southeast Regional SICB Meeting at Clemson University.

2025 Taylor, J.R.*, Anderson, J.A.*, Pulliam*, J.N., J.J. Socha. From branch to air: advancing our understanding of axial twist in flying snakes. Talk presented at the Southeast Regional SICB Meeting at Clemson University.

2025 Ryu, S., Zhang, H., Salcedo, M.K., Socha, J.J., Pass, G. Transient perfusion through a microfluidic dragonfly wing model. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2025 Wyckoff*, J., Khandelwal, P.C., Socha, J.J., Olberding, J. The fecal fling: Spring-powered frass ejection in skipper caterpillars. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2025 Socha, J.J., T., Mach*, A., Bryan-II*, T., Taylor*, J.R. Does water loss or hemolymph pumping explain mass loss during wing development in cicadas? Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2025 Pulliam*, J.N., Anderson, J.A.*, K.D. Braxton-Hall*, Sequeira*, Y., Taylor*, J.R., J.J. Socha. Walking the tightrope: Is vertical gap crossing in snakes influenced by perch diameter? Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2025 Khandelwal, P., Bryan-II*, T., Mach*, A., Taylor*, J.R., J.J. Socha. The biomechanics of wing coupling in cicadas. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2025 Sequeira, Y.*, Carrington, E., J.J. Socha. Self-righting behavior of benthic crabs in freefall. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2025 Taylor, J.R.*, Anderson, J.A.*, Pulliam*, J.N., J.J. Socha. Axial twist: A flying snake's secret weapon for jumping? Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2025 Anderson, J.A.*, Pulliam*, J.N., Sequeira*, Y., K.D. Braxton-Hall*, K. Fangyen*, A.E. Moore*, P.C. Khandelwal, I.T. Moore, J.J. Socha. Do semi-arboreal snakes feed differently between arboreal vs. terrestrial environments? Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Atlanta, GA.

2024 Pulliam*, J.N., Anderson, J.A.*, K.D. Braxton-Hall*, Sequeira*, Y., Taylor*, J.R., J.J. Socha. Walking the tightrope: Is vertical gap crossing in snakes influenced by perch diameter? Talk presented at the Southeast Regional SICB Meeting at James Madison University.

2024 Khandelwal, P., Bryan-II*, T., Mach*, A., Taylor*, J.R., J.J. Socha. The biomechanics of wing coupling in cicadas. Talk presented at the Southeast Regional SICB Meeting at James Madison University.

2024 Sequeira, Y.*, Carrington, E., J.J. Socha. Self-righting behavior of benthic crabs in freefall. Talk presented at the Southeast Regional SICB Meeting at James Madison University.

2024 Taylor, J.R.*, Anderson, J.A.*, Pulliam*, J.N., J.J. Socha. Axial twist: A flying snake's secret weapon for jumping? Poster presented at the Southeast Regional SICB Meeting at James Madison University.

2024 Anderson, J.A.*, Pulliam*, J.N., Sequeira*, Y., K.D. Braxton-Hall*, K. Fangyen*, A.E. Moore*, P.C. Khandelwal, I.T. Moore, J.J. Socha. Do semi-arboreal snakes feed differently between arboreal vs. terrestrial environments? Poster presented at the Southeast Regional SICB Meeting at James Madison University.

2024 Moore*, A., B.Z. Socha*, M. Moore*, J. Taylor*, Y. Sequeira*, I.T. Moore, J.J. Socha. Swimming, terrestrial, and land-to-water locomotion in an aquatic caterpillar. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Seattle, WA.

2024 Pulliam*, J.N., S. Blacksten*, M. Dooley*, J. Anderson*, K. Braxton-Hall*, J. Alexander, S. Ewing, J.J. Socha. Look Mom, No Hands: Effects of perch diameter on vertical gap crossing in arboreal snakes. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Seattle, WA.

2024 Sequeira*, Y., J.J. Socha. When Squid Fly: Encapsulating the anatomy of the flying squid in a working robotic model. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Seattle, WA.

2024 Wilmsen, S.M., S. Zaslavsky*, D. Hopkins*, B. Palm, S. Khan*, V. Nikitin, P Shevchenko, A. Staples, J.J. Socha. Scaling analysis of taenidia in beetle (*Zophobas morio*) tracheae. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Seattle, WA.

2024 Socha, J.J., J.Anderson*, B.Z. Socha*, A. Moore*, I.T. Moore, T. Mortensen, E. Torres Pacaya, A. Marsh*. *Chironius*: a new jumping snake from South America. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Seattle, WA.

2024 Anderson, J.A.*, Pulliam*, J.N., J. Wong, C. Barnett*, I.T. Moore, U. Grafe, S. Khalid, J.J. Socha. How does height influence perch-related locomotor behaviors in arboreal snakes? Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Seattle, WA.

2024 Mathur, T.*, L. Zhang, J. Gibson, O. Bolmin, J.J. Socha, M. Alleyne, S. Wilmsen, K. Fezzaa, A. Wissa. Go with the flow: Developing a scaffold to examine the energy flow within click beetles. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Seattle, WA.

2023 Gong*, Y. J.Wang*, W. Zhang*, J.J. Socha, H. Dong. Influence of tracheal microstructure on insect respiratory flows. Talk presented at the 76th Annual Meeting of the APS Division of Fluid Dynamics, Washington, DC.

2023 Khan*, S., S.M. Wilmsen, S. Zaslavsky*, M. Dingra*, A. Staples, J.J. Socha. Influence of tracheal microstructure on insect respiratory flows. Talk presented at the 76th Annual Meeting of the APS Division of Fluid Dynamics, Washington, DC.

2023 Njike*, D., M. Stremler, C. Vinauger, S. Wilmsen, J.J. Socha, C. Lahondere. Influence of tracheal microstructure on insect respiratory flows. Poster presented at the 76th Annual Meeting of the APS Division of Fluid Dynamics, Washington, DC.

2023 Diggs, S*. M. Stremler, J.J. Socha, C. Lahondere, C. Vinauger. Effects of fluid properties on mosquito feeding: Modulation of the cibarial and pharyngeal pumps' dynamics. Talk presented at the Entomology Society of America Annual Conference, Washington, DC.

2023 Zaslavsky*, S., S.M. Wilmsen, D. Hopkins*, B. Palm, S. Khan*, V. Nikitin, P Shevchenko, A. Staples, J.J. Socha. Scaling analysis of taenidia in beetle (*Zophobas morio*) tracheae. Poster presented at the Southeast Regional SICB Meeting of DCB/DVM at Virginia Tech.

2023 Anderson, J.A.*, Pulliam*, J.N., J. Wong, C. Barnett*, I.T. Moore, U. Grafe, S. Khalid, J.J. Socha. How does height influence perch-related locomotor behaviors in arboreal snakes? Talk presented at the Southeast Regional SICB Meeting of DCB/DVM at Virginia Tech.

2023 Khan*, S., Zaslavsky*, S., S.M. Wilmsen, A. Staples, J.J. Socha. Influence of tracheal microstructure on insect respiratory flows. Poster presented at the Southeast Regional SICB Meeting of DCB/DVM at Virginia Tech.

2023 Dooley*, M., J.A. Anderson*, S. Blacksten*, J. Pulliam*, S. Ewing*, K. Braxton-Hall*, J.J. Socha. Do snakes feed differently in an arboreal environment? Poster presented at the 4th Annual Summer Undergraduate Research Symposium at Virginia Tech.

2023 Blacksten*, S., J.N. Pulliam*, M. Dooley*, J. Anderson*, K. Braxton-Hall*, J. Alexander, S. Ewing, J.J. Socha. Look Mom, No Hands: Effects of perch diameter on vertical gap crossing in arboreal snakes. Poster presented at the 4th Annual Summer Undergraduate Research Symposium at Virginia Tech.

2023 Ajyeman*, K., S. Wilmsen , C. Vinauger, C. Lahondère, J.J. Socha. Sexual dimorphism in the feeding apparatus of blood-feeding mosquitoes. Poster presented at the 4th Annual Summer Undergraduate Research Symposium at Virginia Tech.

2023 Salcedo, M.K., T. Ellis, G. Osgood, E. Goethe, J. Menolascino, S. Collins, D. Hertzell, M. Boggs, S. Doorani, J. Avery, T. Palmrose, D. Kainaat, E. Cossey, S.M. Tahir, J.G. Wolf, A. Bahamonde, M.D. Johnson, T. Lober, J.J. Socha, R. Overson, A. Cease. Wing expansion in gregarious migratory locusts. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Austin, TX.

2023 Wilmsen, S., C. Vinauger, C. Lahondère, P. Shevchenko, K. Fezzaa, J.J. Socha. Comparison of the feeding mechanism between sexes in two blood-feeding mosquitoes. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Austin, TX.

2023 Ryu, S., H. Zhang, M.K. Salcedo, J.J. Socha, G. Pass. Transient perfusion flow patterns in a dragonfly forewing elucidated using a microfluidic model. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Austin, TX.

2023 Mathur, T.*, L. Zhang*, M. Alleyne, J.J. Socha, S. Wilmsen, K. Fezzaa, S. Clark, A. Wissa. Latching, loading, and release in click beetles under different mechanical constraints. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Austin, TX.

2023 Anderson, J.A.*, J.N., Pulliam*, J. Wong, I.T. Moore, U. Grafe, S. Khalid, J.J. Socha. How does height influence perch-related locomotor behaviors in arboreal snakes? Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Austin, TX.

2023 Pulliam, J.N.*, G. Morris*, S. Haywood*, Z. King*, J.A. Anderson*, J. Wong, B.Z. Socha*, U. Grafe, S. Khalid, J.J. Socha. Reach for the skies: Effects of perch diameter on vertical gap crossing capabilities of arboreal snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Austin, TX.

2023 King, Z.*, I. Devgan*, S. Haywood*, G. Morris*, J.A. Anderson*, J.N. Pulliam*, J. Wong, B.Z. Socha*, U. Grafe, S. Khalid, J.J. Socha. Tongue-sticking in arboreal colubrids during gap crossing. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Austin, TX.

2022 Hillen, A.P.*, G.D. Gross, S.S. Hilaire, A.E. Mayfield, J.R. Foley, M.K. Salcedo, J.J. Socha, K. Xia, S.M. Salom. Aestivation studies and the effect of imidacloprid on the subterranean life cycle of *Laricobius* spp., biological control agents for the hemlock woolly adelgid. Talk presented at the Entomological Society of American Annual Conference, Vancouver, BC.

2022 Anderson, J.A.*, J.N., Pulliam*, J. Wong, I.T. Moore, U. Grafe, S. Khalid, J.J. Socha. How does height influence perch-related locomotor behaviors in arboreal snakes? Poster presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Durham, NC.

2022 Pulliam, J.N.*, G. Morris*, S. Haywood*, Z. King*, J.A. Anderson*, J. Wong, B.Z. Socha*, U. Grafe, S. Khalid, J.J. Socha. Reach for the skies: Effects of perch diameter on vertical gap crossing capabilities of arboreal snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Durham, NC.

2022 Socha, J.J. Things that didn't work. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Durham, NC.

2022 Morris, G.*, Pulliam, J.N.*, J.A. Anderson*, Z. King*, S. Haywood*, J. Wong, B.Z. Socha*, U. Grafe, S. Khalid, J.J. Socha. Vertical gap crossing in close relatives of flying snakes. Poster presented at the Virginia Tech Summer Research Conference, Blacksburg, VA.

2022 King, Z.*, S. Haywood*, G. Morris*, J.A. Anderson*, J.N. Pulliam*, J. Wong, B.Z. Socha*, U. Grafe, S. Khalid, J.J. Socha. Tongue-sticking: Tongue behavior of arboreal colubrids during gap crossing. Poster presented at the Virginia Tech Summer Research Conference, Blacksburg, VA.

2022 Haywood, S.*, Pulliam, J.N.*, Z. King*, G. Morris*, J.A. Anderson*, J. Wong, U. Grafe, S. Khalid, J.J. Socha. Body flattening in a close relative of flying snakes, *Dendrelaphus pictus*. Poster presented at the Virginia Tech Summer Research Conference, Blacksburg, VA.

2022 Hillen, A.P.*, G.D. Gross, S.S. Hilaire, A.E. Mayfield, J.R. Foley, M.K. Salcedo, J.J. Socha, K. Xia, S.M. Salom. Aestivation studies and the effect of imidacloprid on the subterranean life cycle of *Laricobius* spp., biological control agents for the hemlock woolly adelgid. Talk presented at the 61st Southern Forest Insect Work Conference, Lexington, KY.

2022 Staples, A.E., Wakefield, J.*, Tahmasian, S., Socha, J.J. Salcedo, M. Go with the Flow: Designing a Biomimetic Fluid-Filled Insect Wing Flapper. Talk presented at the 2022 Atlantic Coast Conference Meeting of the Minds Conference, UVA.

2022 Staples, A.E., Mikel-Stites, M.R.*, Salcedo, M.K., Marek, P. Socha, J.J., An improved model for directional hearing in a parasitoid fly. Talk presented at the 2022 Engineering Mechanics Research Symposium, Blacksburg, VA.

2022 Khandelwal, P.C., Socha, J.J., Hedrick, T.L., Jusufi, A. The role of tail during reorientation in flying lizards. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Phoenix, AZ.

2022 Pulliam, J.N.*, Salcedo, M.K., Socha, J.J. Hold on tight: How friction influences climbing in cicada nymphs and adults. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Conference, Phoenix, AZ.

2022 Ellis, T.E.*, Jones, T.J., Ushay, C., Henry, A., Brun, P.T., Socha, J.J. The ol' ball and chain: a new model of branch-landing mechanics in flying snakes. Talk presented virtually at the Society for Integrative and Comparative Biology Annual Conference online platform (SICB+).

2022 Ryu, S., Zhang, H., Salcedo, M.K., Socha, J.J., Pass, G. Transient perfusion flow patterns in a dragonfly forewing elucidated using a microfluidic model. Talk presented virtually at the Society for Integrative and Comparative Biology Annual Conference online platform (SICB+).

2022 Gong, Y.*., J. Zhang, J.J. Socha, H. Dong. Effects of body shape on aerodynamic performance and wake structures in snake-like gliding. Talk presented at the AIAA Science and Technology Forum and Exposition, San Diego, CA.

2021 Pulliam, J.N.*, Salcedo, M.K., Socha, J.J. Hold on tight: How friction influences climbing in cicada nymphs and adults. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Zoo Atlanta, Atlanta, GA.

2021 Salcedo, M.K., Shevchenko, P.D., Socha, J.J. Whole-wing microtomographic imaging of grasshopper wings. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), held virtually online.

2021 Socha, J.J., Pulliam, J.N.*, Salcedo, M.K., Hernandez, A.M., Weiss, T.M., Jackson, B.E. Wing flexibility of cicadas during takeoff: A pandemic story. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), held virtually online.

2021 Pulliam, J.N.*, Salcedo, M.K., Weiss, T.M.*, Hernandez, A.M., Socha, J.J. Climbing strategies of cicadas across vertical 'gaps' of low friction. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), held virtually online.

2021 Graham, M.*, Clemente, C.J., Socha, J.J. Body size influences transition to dynamic gap crossing movements in australian tree snakes. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), held virtually online.

2021 Harrison, J.F., Wagner, J.M., Aivazian, V.*, Duell, M.E., Klok, C.J., Weed, M.*, Munoz, E.*, Vandenbrooks, J.M., Fezzaa, K., Socha, J.J. How to be a giant: hypermetric scaling of leg tracheal systems in cockroaches and scarab beetles suggests oxygen transport to the legs limits maximal insect size. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), held virtually online.

2021 Mikel-Stites, M.R.*, Salcedo, M.K., Socha, J.J., Staples, A.E. Three-dimensional imaging of tympanal membranes in a parasitoid fly enables a new model of hearing. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), held virtually online.

2020 Mikel-Stites, M.R.*, Salcedo, M.K., Socha, J.J., Staples, A.E. Three-dimensional imaging of tympana provides critical correction to model for hearing in a parasitoid fly. Talk presented at the 73rd Annual Meeting of the APS Division of Fluid Dynamics, held virtually online.

2020 Graham, M.*, Clemente, C.J., J.J. Socha. Gap crossing behavior varies with body size in Australian tree snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, University of North Carolina, NC, held virtually online.

2020 Pulliam, J.N.*, Salcedo, M.K., Weiss, T.M.*, Hernandez, A.M., Socha, J.J. Stick to it: Climbing strategies of cicadas across vertical 'gaps' of low friction. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, University of North Carolina, NC, held virtually online.

2020 Whitehead, J.G.*, Worrell, T.A.*, Socha, J.J. Influence of approach trajectory on water landings in mallards? Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Austin, TX.

2020 Zamore, S.A., Araujo, N.*, Socha, J.J. Visual behavior in flying snakes: measurement and exploration with virtual reality. Invited symposium talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Austin, TX. Symposium: Long Limbless Locomotors: The Mechanics and Biology of Elongate, Limbless Vertebrate Locomotion.

2020 Hardy, D.J.*, Salcedo, M.K., Kenny, M.C., Pulliam, J.N.*, Pendar, H., Socha, J.J. Shot through the heart: a non-invasive IR technique to measure dorsal heart pumping in insects. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Austin, TX.

2020 Worrell, T.A.*, Weiss, T.M.*, Gonzalez, M.G.*, Whitehead, J.G.*, Salcedo, M.K., Pulliam, J.N.*, Graham, M., Socha, J.J. Development of a multi-camera array to study gliding in flying snakes. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Austin, TX.

2019 Graham, M.*, M. Coffey*, J.J. Socha. Investigating influence of body size on gap-crossing behavior in Australian tree snakes (*Dendrelaphis*). Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Wake Forest University, Winston-Salem, NC.

2019 Weiss, T.*, J.J. Socha. What do you call it when...the (lack) of terminology for interfacial locomotion. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Wake Forest University, Winston-Salem, NC.

2019 Whitehead, J.*, J.J. Socha. Influence of approach trajectory on water landings in mallards. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Wake Forest University, Winston-Salem, NC.

2019 Socha, J.J. The BIOTRANS interdisciplinary graduate program at Virginia Tech. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Wake Forest University, Winston-Salem, NC.

2019 Zamore, S.A., Socha, J.J. Development of a virtual reality arena to study vision in flying snakes. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Tampa, FL.

2019 Adjerid, K..*, Sood, N., De Vita, R., Socha, J.J. Variation of Young's modulus and taenidial density in the tracheae of a darkling beetle. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Tampa, FL.

2019 Socha, J.J., Hernandez, P., Ossenkopp, S., Graham, M., Zamore, S. Tongue-sticking: A static tongue flick in flying snakes. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Tampa, FL.

2019 Kenny, M.C.*, Crandall, C.L.*, Sinclair, B.J., Socha, J.J. Effects of environmental temperature on viscosity of *Manduca sexta* hemolymph. Talk (in the DCB Best Student Paper: Mimi A.R. Koehl and Steven Wainwright Award session) presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Tampa, FL.

2019 Bolmin, O..*, Socha, J.J., Alleyne, M., Dunn, A.C., Wissa, A.A. The click beetle latch mechanism: An in-vivo study using synchrotron x-rays. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Tampa, FL.

2019 Whitehead, J.G.*, Socha, J.J. Do mallards landing on water exhibit tau theory strategies? Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Tampa, FL.

2018 Socha, J.J., Yeaton, I.J.*, S.D. Ross. Undulation enhances stability, enabling gliding in flying snakes. 72th Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA.

2018 Deng, X., Bode-Oke, A., H. Dong, I. Yeaton, J. Socha. Gliding with body undulations: 3D flow simulations of a flying snake. Submission to the Gallery of Fluid Motion. 72th Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA.

2018 Chatterjee, K.*, P.M. Graybill, J. Garrett, R.V. Davalos, J.J. Socha, and A.E. Staples. Insect-inspired flow control in microfluidic networks. 72th Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA.

2018 Adjerid, K.*, De Vita R., and J.J. Socha. A study on the biomechanics of insect respiration as a platform for microfluidic devices. Poster presented at the annual meeting of the Biomedical Engineering Society (BMES), Atlanta, GA.

2018 Crandall, C.*, M.C. Kenny*, J.J. Socha. Effects of rearing temperature on the viscosity of hemolymph in *Manduca sexta* larvae. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Clemson, Greenville, SC.

2018 Garrett, J.* , Socha J.J. (2018). Modeling microfluidic flow in an insect-inspired system. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Clemson, Greenville, SC.

2018 Weiss, T.M.*, S. Sane, M. Graham, S. Jung, T. L. Hedrick, and J.J. Socha. 3D trajectories of in-field recordings of the common skittering frog, *Euphlyctis cyanophlyctis*. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Clemson, Greenville, SC.

2018 Whitehead, J.G.*, Socha, J.J. Do mallards landing on water exhibit tau theory strategies? Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Clemson, Greenville, SC.

2018 Yeaton, I.*, S.D. Ross, J.J. Socha. Undulation enhances stability, enabling gliding in flying snakes. 8th World Congress of Biomechanics, Dublin, Ireland. (presented by Ross)

2018 Socha, J.J., Pendar, H., Adjerid, K.*, Garrett, J., De Vita, R., Fox, T., Harrison, J., Mechanisms of tracheal compression in insects, 8th World Congress of Biomechanics, Dublin, Ireland (2018) (talk cancelled due to travel problems)

2018 Adjerid, K.*, N. Sood, R. De Vita, J.J. Socha. Measuring variation in material and structural properties of darkling beetle tracheae. Poster presented at the 2018 Virginia Tech SBES Symposium, Winston-Salem, NC.

2018 Kenny, M.C.*, C. Crandall*, J.J. Socha. Effects of rearing temperature on the viscosity of hemolymph in *Manduca sexta* larvae. Talk presented at the 2018 Virginia Tech SBES Symposium, Winston-Salem, NC.

2018 Garrett, J.*, R. Davalos, J.J. Socha. Respiratory coordination in the hissing cockroach to produce unidirectional airflow. Poster presented at the 2018 Virginia Tech SBES Symposium, Winston-Salem, NC.

2018 Harrison, J.F., Kassi, A., Adjerid*, K., Klok, C.J., Vandenbrooks, J.M., Duell*, M.E., Campbell*, J.E., Alanis, E., Abdo, C., Pendar, H., Socha, J.J. Gravity effects on hemolymph and air distribution in the grasshopper, *Schistocerca americana*. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), San Francisco.

2018 Zamore, S., Socha, J.J. Head wagging and visual acuity in flying snakes (*Chrysopelea*). Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), San Francisco.

2018 Graham, M.*, Jayne, B.C., Socha, J.J. Gap distance affects behavior and precision of movement in flying snakes. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), San Francisco. (won Steven Vogel Award for best poster, Division of Comparative Biomechanics)

2018 Adjerid, K.*, N. Sood, R. De Vita, Socha, J.J. Variation in Young's modulus of tracheal tubes in the beetle *Zophobas morio*. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), San Francisco.

2017 Graham, M.*, Jayne, B.C., Socha, J.J. Gap distance affects behavior and precision of movement in flying snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Virginia Tech.

2017 Graham, M.*, Weiss, T.M.*, Jayne, B.C., Socha, J.J. Jumping behaviors increase gap bridging performance in the flying snake *Chrysopelea paradisi*. Poster presented at the Graduate Student Association Research Symposium, Virginia Tech.

2017 Graham, M.*, Weiss, T.M.* Jayne, B.C., Socha, J.J. Jumping behaviors increase gap bridging performance in the flying snake *Chrysopelea paradisi*. Poster presented at the BEAM Symposium, Virginia Tech.

2017 Adjerid, K.*, N. Sood, R. De Vita, Socha, J.J. Variation in Young's modulus of tracheal tubes in the beetle *Zophobas morio*. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Virginia Tech.

2017 Kenny, M.C.*, Giarra, M.N.*, Socha, J.J. How temperature influences the viscosity of hornworm hemolymph. Poster presented at the annual Summer Biomechanics, Bioengineering, and Biotransport Conference, Tucson, AZ.

2017 Yeaton, I.J.*, Ross, S.D., Socha, J.J. Lift and drag forces on flying snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Virginia Tech.

2017 Yeaton, I.J.*, G. Nave*, Socha, J.J., Ross, S.D. Stability properties of flying snakes during transient glides. Poster presented at the Society for Industrial and Applied Mathematics Conference on Applications of Dynamical Systems (DIAM DS17) Annual Meeting, Snowbird, UT. (won Red Sock award for best poster)

2017 Garrett, J.*, Socha J.J, Davalos, R.V. Biomechanically inspired design: Insects, skittering frogs, and flying snakes. Presentation at Balticon. Baltimore, MD.

2017 Garrett J.*, Davalos R., Socha J.J. A fluid dynamics simulation to explore the insect respiratory system. Poster presented at the 2017 Virginia Tech SBES Symposium. Blacksburg, VA.

2017 Adjerid, K.*, H. Pendar, R. De Vita, J.J. Socha. Mechanical response of the tracheal system to hemolymph pressure in the beetle *Zophobas morio*. Poster presented at the 2017 Virginia Tech SBES Symposium. Blacksburg, VA.

2017 Zamore, S., Socha, J.J. How to assess visual control: designing a virtual arena for flying snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Virginia Tech.

2017 Yeaton, I.J.*, Ross, S.D., Socha, J.J. Kinematics and stability of flying snakes during transient glides. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA. (won Mimi A.R. Koehl and Steven Wainwright Award for best talk, Division of Comparative Biomechanics)

2017 Zamore, S.A.*, Bochicchio, L, Socha, J.J. Visual acuity of flying snakes: behavioral responses to optokinetic stimuli. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2017 Kenny, M.C.*, Giarra, M.N., Rogers, P.S., Barnes, A., Socha, J.J. How temperature influences the viscosity of hornworm hemolymph. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2017 Aprelev, P.*, Kenny, M.*, Socha, J.J., Kornev, K. Rheological behavior of insect hemolymph on macro-, micro-, and nano-scales. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2017 Adjerid, K.*, Pendar, H., De Vita, R., Socha, J.J. Predicting the mechanical response of (*Zophobas morio*) tracheal tubes to hemolymph pressure. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2017 Ko, Y.*, Pendar, H., Socha, J.J. Kinematic analysis of gut movements in the beetle *Zophobas morio* reveals linkages to circulation and respiration. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2017 Graham, M.*, Weiss, T.*, Jayne, B.C., Socha, J.J. Jumping as a gap-bridging strategy in flying snakes. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2017 Weiss, T.M.*, Sane, S., Graham, M.*, Jung., S., Hedrick, T.L., Socha, J.J. Jumping on water: field recordings of the skittering frog *Euphlyctis cyanophlyctis*. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2017 Whitehead, J.G.*, Socha, J.J. A kinematic study of how mallards land on water. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology, New Orleans, LA.

2016 Adjerid, K.*, Pendar H.*, and J.J. Socha. Mechanical response of the tracheal system to hemolymph pressure in the beetle *Zophobas morio*. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB), Portland, OR.

2016 Adjerid, K.*, Pendar H., De Vita R., and J.J. Socha. Predicting the mechanical response of insect tracheal tubes to hemolymph pressure. Talk presented at the Virginia Tech Biomedical Engineering And Mechanics (BEAM) Fall Fluid Mechanics Symposium, Blacksburg, VA.

2016 Adjerid, K.*, Pendar H.*, and J.J. Socha. Mechanical response of the tracheal system to hemolymph pressure in the beetle *Zophobas morio*. Poster presented at the presented at the Virginia Tech-Wake Forest SBES Symposium, Winston-Salem, NC.

2016 Adjerid, K.*, Pendar H., De Vita R., and J.J. Socha. Predicting the mechanical response of insect tracheal tubes to hemolymph pressure. Poster presented presented at the annual meeting of the Biomedical Engineering Society (BMES), Minneapolis, MN.

2016 Adjerid, K.*, De Vita R., and J.J. Socha. Predicting the mechanical response of insect tracheal tubes to hemolymph pressure. Talk presented at the Southeast regional meeting of the Society for Integrative and Comparative Biology (rSICB), Duke University, Durham, NC.

2016 Garrett, J.*, Socha JJ. Delayed-phase actuation helps drive unidirectional airflow in the insect respiratory system. Talk given at the Southeast Regional Society for Integrative and Comparative Biology Meeting. Durham, NC.

2016 Graham, M.G.*, Weiss, T.*, Jayne, B.C., Socha, J.J.. Jumping as a gap-bridging strategy in flying snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Duke University, Durham, NC.

2016 Kenny, M.C.*, Giarra, M.N.*, Rogers, P.S.*, Barnes, A., Socha, J.J. How temperature influences the viscosity of hornworm hemolymph. Talk presented at the Society for Integrative and Comparative Biology Regional Southeast Conference, Duke University, Durham, NC.

2016 McLean, A.*, Weiss, T.*, Socha, J.J. The shape of a flying snake: Extracting aerodynamics for insight on unconventional aircraft design. Talk presented at the Southeast regional meeting of the Society for Integrative and Comparative Biology (rSICB), Duke University, Durham, NC.

2016 Whitehead, J.G.*, Socha, J.J. A kinematic study of how mallards land on water. Talk presented at the Southeast regional meeting of the Society for Integrative and Comparative Biology (rSICB), Duke University, Durham, NC.

2016 Zamore, S.A.*, Bochiccio, L, Socha, J.J. Characteristics of vision in flying tree snakes. Talk presented at the Southeast regional meeting of the Society for Integrative and Comparative Biology (rSICB), Duke University, Durham, NC.

2016 Garrett, J.*, Davalos, R., Socha JJ. Using inspiration and expiration from the hissing cockroach to design new microfluidics. Talk given at Society for Integrative and Comparative Biology Annual Meeting, Portland, OR.

2016 Garrett, J.*, Socha J.J.. A fluid dynamics simulation to explore the insect respiratory system. Poster presented at the Virginia Tech-Wake Forest SBES Symposium. Winston-Salem, NC.

2016 Garrett, J.*, Davalos, R., Socha JJ. Using inspiration and expiration from the hissing cockroach to design new microfluidics and investigate respiration. Invited talk presented in the symposium, "The Limits of Respiratory Function: External and Internal Constraints on Insect Gas Exchange" at the International Congress of Entomology, Orlando, FL.

2016 Garrett, J.*, Davalos, R., Socha JJ. Using computational fluid dynamics to investigate how insects drive unidirectional microfluidic flow. Talk given at the Virginia Tech Fall Fluids Symposium. Blacksburg, VA.

2016 Kenny, M.C.*, Tegelman-Malabad, P., Miller, L., Socha, J.J. Development of a 3D model of the beetle heart to understand flow production. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology, Portland, OR.

2016 Kenny, M.C.*, Tegelman-Malabad, P., Miller, L., Socha, J.J. Development of a 3D model of the beetle heart to understand flow production. Poster presented at the annual Graduate Student Assembly Research Symposium, Virginia Tech, Blacksburg, VA.

2016 Kenny, M.C.*, Tegelman-Malabad, P., Miller, L., Socha, J.J. Development of a 3D model of the beetle heart to understand flow production. Poster presented at the annual Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences Symposium, Wake Forest University, Winston-Salem, NC.

2016 Lages, W.S.*, Laha, B., Miller, W., Novotny, J., Laidlaw, D.H., Socha, J.J. and Bowman, D.A. 2016. Effects of field of regard and stereoscopy and the validity of MR simulation for visual analysis of scientific data. (215-216). IEEE Virtual Reality, Greenville, SC.

2016 Lages, W.S.*, Arango, G.A., Laidlaw, D.H., Socha, J.J. and Bowman, D.A. 2016. March. Designing capsule, an input device to support the manipulation of biological datasets. (pp. 255-256). IEEE Symposium on 3D User Interfaces (3DUI), Greenville, SC.

2016 Pendar, H., Socha, J.J. The multi-linked mechanism of active ventilation in beetles: An inspiration for novel flow control. Invited talk presented in the symposium, "Bioinspiration Crossing Disciplinary Borders" at the International Congress of Entomology, Orlando, FL.

2016 Weiss, T.M.*, S. Sane, M. Graham*, S. Jung, T. L. Hedrick, and J.J. Socha. Skipping on water: High-speed recordings of skittering locomotion in the frog *Euphlyctis cyanophlyctis*. Annual Fall Fluids Symposium, Virginia Tech.

2016 Weiss, T.M.* and Socha, J.J. Jumping on water: field recordings of the skittering frog *Euphlyctis cyanophlyctis*. Society for Integrative and Comparative Biology (SICB) Regional SouthEast Conference, Duke University, Durham, NC.

2016 Whitehead, J.W.*, Socha, J.J. A kinematic study of how birds land on water. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, Duke University, Durham, NC.

2016 Yeaton, I.J.*, Socha, J.J., Ross S.D.. The stability of flying snakes during transient glides. Talk presented at 24th International Congress of Theoretical and Applied Mechanics. Montréal, Canada.

2016 Socha, J.J., Baumgardner, G*, Ross S.D., Yeaton, I.J.*. A new understanding of aerial undulation in flying snakes. Talk presented at 24th International Congress of Theoretical and Applied Mechanics. Montréal, Canada.

2016 Socha, J.J., Giarra, M.N.*, Harrison, J.F., Kenny, M.C.*, Miller, L.A., Goergen, C.J., Vlachos, P.P. New methods for understanding flow production in the dorsal vessel. Invited talk presented in the symposium, "The Insect Circulatory System: Vital but Widely Neglected!" at the International Congress of Entomology, Orlando, FL.

2016 Yeaton, I.J.*, Baumgardner, G.*, Ross, S.D., Socha, J.J. Multi-terrain locomotor interactions in flying snakes. Talk presented at the American Physical Society (APS) March Meeting. Baltimore, MD.

2016 Yeaton, I.J.*, Baumgardner, G.*, Weiss, T.*, Nave, G.*, Ross, S.D., Socha, J.J. Snakes in a Cube: High-resolution kinematics of gliding in flying snakes. Talk presented at the Society for Integrative and Comparative Biology (SICB) Annual Meeting. Portland, OR.

2016 Yeaton, I.J.*, Baumgardner, G.*, Socha, J.J. Flying snake landing. How limbless gliders dissipate energy on impact. Poster presented at the Society for Integrative and Comparative Biology (SICB) Annual Meeting. Portland, OR.

2015 Cooper-Bailey, K., Smith, S., Zimmerman, K., Saunders, G., Socha, J.J. Hepatocellular adenoma in a paradise flying tree snake (*Chrysopelea paradisi*). 2015 ExoticsCon Conference (joint meeting of AAV, ARAV, and AEMV), San Antonio, TX.

2015 De Vita, R., M.R. Webster*, J.J. Socha, P. Nardinocchi, L. Teresi. The insect respiratory system: A source of bio-inspiration for tissue vascularization. Biomedical Engineering Society Annual Meeting, Tampa, FL.

2015 Adjerid, K.*, Pendar H., Socha, J.J. Mechanical response of the tracheal system to hemolymph pressure in the beetle *Zophobas morio*. Society for Integrative and Comparative Biology Regional Southeast Conference, Georgia Tech, Atlanta, GA.

2015 Kenny, M.*, Tegelman-Malabad, P., Socha, J.J. Functional morphology of the heart of a beetle. Society for Integrative and Comparative Biology Regional Southeast Conference, Georgia Tech, Atlanta, GA.

2015 Pendar, H., Socha, J.J. Who farted in the room? Society for Integrative and Comparative Biology Regional Southeast Conference, Georgia Tech, Atlanta, GA.

2015 Weiss, T.M.*, Jung, S., Socha, J.J. Modulation of foot shape as a strategy for controlling jump height from water in the frog *Euphlyctis cyanophlyctis*. Society for Integrative and Comparative Biology Regional Southeast Conference, Georgia Tech, Atlanta, GA.

2105 Yeaton, I.J.*, Baumgardner, G.*, Weiss, T.*, Nave, G.*, Ross S.D., Socha, J.J. Recent experiments on flying snake kinematics. Society for Integrative and Comparative Biology Regional Southeast Conference, Georgia Tech, Atlanta, GA.

2015 Whitehead, J.G.*, Socha, J.J., Phillips, J.B. Spontaneous magnetic orientation in *Drosophila*. Poster presented at the Society for Integrative and Comparative Biology Regional Southeast Conference. Georgia Tech, Atlanta, GA.

2015 Yeaton, I.J.*, Baumgardner, G.*, Weiss, T.*, Nave, G.*, Ross, S.D., Socha, J.J. What's its wave? A 3D analysis of flying snake locomotion. American Physical Society 68th Annual Meeting of the Division of Fluid Dynamics, Boston, MA.

2015 Tegelman-Malabad, P., Kenny, M.*, Socha, J.J. Morphology of the dorsal vessel in the darkling beetle *Zophobas morio*. Summer Undergraduate Research Symposium, Virginia Tech, Blacksburg, VA.

2015 Adjerid, K.*, Pendar, H.*, Harrison, J.F., Socha, J.J. A test of functional compartmentalization in the grasshopper *Schistocerca americana* using pressure recordings. Talk presented at the Virginia Tech-Wake Forest SBES Symposium, Blacksburg, VA.

2015 Kenny, M.*, Socha, J.J. Does Murray's law apply to the tracheal system in insects? A 3D study of the beetle Platynus decentis. Poster presented at the Annual Interdisciplinary Honor Society IDR Day, Blacksburg, VA.

2015 Kenny, M.*, Socha, J.J. Does Murray's Law apply to the tracheal system in insects? A 3D study of the beetle *Platynus decentis*. Poster presented at the Virginia Tech-Wake Forest SBES Symposium, Blacksburg, VA.

2015 Yeaton, I.J.*, Socha, J.J., Ross S.D. Snakes on an invariant plane: coupled translational-rotational dynamics of flying snakes. Society for Industrial and Applied Mathematics conference on Applications of Dynamical Systems, Snowbird, UT.

2015 Silverman, R.E.*, Giarra, M.*, Gursoy, D., Socha, J.J. Using TomoPy to reconstruct synchrotron micro-CT data from organisms. Poster presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Garrett, J.*, Socha, J.J. The Madagascar hissing cockroach modulates abdominal pump frequency and spiracle phasing to compensate for hypoxia. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Adjerid, K.*, Pendar, H*, Harrison, J.F., Socha, J.J. Functional compartmentalization in the hemocoel of the American locust. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Jafari, F.*, Tahmasian, S.*, Ross, S.D., Socha, J.J. A theoretical investigation of stability characteristics of flying snakes using n-chain modeling: Is gliding possible without undulation? Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Yeaton, I.J.*, Socha, J.J., Ross, S.D. A generalized dynamical framework for non-equilibrium gliding in animals. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Socha, J.J., Twyman, C.*, Yeaton, I.J.* Landing without limbs: body shape during arboreal landings in flying snakes. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Kenny, M.*, Socha, J.J. Does Murray's law apply to the tracheal system in insects? A 3D study of the beetle *Platynus decentis*. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Weiss, T.M.*, Jung, S., Vlachos, P.P., Socha, J.J. Modulation of forces in water-based jumps by the frog *Euphlyctis cyanophlyctis*. Talk presented at the annual meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.

2015 Kenny, M.*, Socha, J.J. Does Murray's law apply to the tracheal system in insects? A 3D study of the beetle *Platynus decentis*. Poster presented at the annual Interdisciplinary Honor Society IDR Day, Blacksburg, VA.

2014 Yeaton, I.J.*, *Weiss, T., Socha, J.J. Flying snakes and skittering frogs and how Isaac Yeaton, Talia Weiss, and Jake Socha study them. Talk presented at the SciPy Conference, Austin, TX.

2014 Garrett, J.* , Socha J.J. Coordination of ventilatory mechanisms in the Madagascar hissing cockroach: Abdominal pumping, tracheal tube collapse, and spiracle valving. Poster presented at Fluid Dynamics in Living Systems Conference. Arlington, VA.

2014 Garrett, J.*, Socha J.J. Coordination of ventilatory mechanisms in the Madagascar hissing cockroach: Abdominal pumping, tracheal tube collapse, and spiracle valving. Poster presented at the Biomedical Engineering Society Annual Conference. San Antonio, TX.

2014 Kenny, M.*, Pendar, H.*, and Socha, J.J. What happens when pupae pump? Internal effects of abdominal movements in the beetle *Zophobas morio*. Poster presented at the annual meeting of the Biomedical Engineering Society, San Antonio, TX.

2014 Weiss, T.M.*, Jung S., Vlachos P., Socha, J.J. Modulation of forces in water-based jumps by the frog *Euphlyctis cyanophlyctis*. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, UNC Chapel Hill.

2014 Whitehead, J.G.*, Socha, J.J., Phillips J.B. Magnetic guidance in waterfowl: A test for magnetic cues in landing behavior. Talk presented at the Society for Integrative and Comparative Biology (SICB) Regional Southeast Conference, UNC Chapel Hill.

2014 Adjerid, K.*, Pendar, H.*, Harrison, J.F., Socha, J.J. Functional compartmentalization in the hemocoel of the American locust, *Schistocerca americana*. Talk presented at Fall Fluids Mechanics Symposium, Virginia Tech, Blacksburg, Virginia.

2014 Weiss, T.M.*, Jung S., Vlachos P., Socha, J.J. Modulation of forces in water-based jumps by the frog *Euphlyctis cyanophlyctis*. Talk presented at the Annual Fall Fluids Symposium, Virginia Tech, Blacksburg VA.

2014 Kamanda, S., Kenny, M.*, Socha, J.J. Puncture, pump, and suck: How does the brown marmorated stink bug actually feed? Summer Undergraduate Research Symposium, Virginia Tech, Blacksburg, VA.

2014 Adjerid, K.*, M. Kenny*, H. Pendar, J.F. Harrison, J.J. Socha. A test of functional compartmentalization in the grasshopper *Schistocerca americana* using internal pressure recordings. Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences (SBES) Graduate Student Research Symposium, Wake Forest, NC.

2014 Garrett, J.*, J.J. Socha. Coordination of ventilatory mechanisms in the Madagascar hissing cockroach: Abdominal pumping, tracheal tube collapse, and spiracle valving. Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences (SBES) Graduate Student Research Symposium, Wake Forest, NC.

2014 Kenny, M.*, H. Pendar, K. Adjerid*, J.J. Socha. What happens when pupae pump? Internal effects of abdominal movements in the beetle *Zophobas morio*. Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences (SBES) Graduate Student Research Symposium, Wake Forest, NC.

2014 Pendar, H., Socha, J.J. mechanical linkage of respiratory, circulatory, and digestive systems in beetles. Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences (SBES) Graduate Student Research Symposium, Wake Forest, NC.

2014 Harrison, J.F., Klok, C.J., Vandenbrooks, J.M., Duell, M.E.*, Campbell, J.B.*, Jirjies, S.*, Socha, J.J. Grasshoppers defy gravity? Body position effects on hemolymph and air distribution in *Schistocerca americana*. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Weiss, T.*, Jung, S., Vlachos, P.P., Socha, J.J. A kinematic analysis of water-surface locomotion in cricket frogs. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Kenny, M.*, Pendar, H., Adjerid, K.*, Socha, J.J. What happens when pupae pump? Internal effects of abdominal movements in the beetle *Zophobas morio*. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Garrett, J.*, Socha, J.J. Coordination of abdominal pumping, spiracular valving, and tracheal compression in the Madagascar hissing cockroach. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Pendar, H., Socha, J.J. Computational methods to determine the instantaneous respiratory patterns of animals from respirometry data. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Giarra, M.N.*, Vlachos, P.P., Socha, J.J. High-speed X-ray visualization of blood flows in the grasshopper heart. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Adjerid, K.*, Kenny, M.*, Pendar, H., Harrison, J.F., Socha, J.J. A test of functional compartmentalization in the grasshopper *Scistocerca americana* using internal pressure recordings. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Seive, J.*, Aviles, J.*, Harrison, J.F., Socha, J.J. A volumetric analysis of the tracheal system of the grasshopper *Schistocerca americana* using μCT. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Pendar, H., Socha, J.J. A 3D kinematic analysis of abdominal motion in darkling beetles. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Webster, M.R.*, Socha, J.J., De Vita, R. Nonlinear elasticity of tracheal tubes in the American cockroach. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2014 Becker, W.R.*, Webster, M.R.*, Socha, J.J., De Vita, R. Variation in tensile properties of tracheal tubes in the American cockroach. Society for Integrative and Comparative Biology Annual Meeting, Austin, TX.

2013 Adjerid, K.*, M. Kenny*, H. Pendar*, J.F. Harrison, J.J. Socha. A test of functional compartmentalization in the grasshopper *Scistocerca americana* using internal pressure recordings. Southeast Regional Society for Integrative and Comparative Biology Meeting, Atlanta, GA.

2013 Garrett, J.F.*, J.J. Socha. Coordination of abdominal pumping, spiracular valving, and tracheal compression in the Madagascar hissing cockroach. Southeast Regional Society for Integrative and Comparative Biology Meeting, Atlanta, GA.

2013 Kenny, M.*, H. Pendar*, K. Adjerid*, J.J. Socha. What happens when pupae pump? Internal effects of abdominal movements in the beetle *Zophobas morio*. Southeast Regional Society for Integrative and Comparative Biology Meeting, Atlanta, GA.

2013 Twyman, C.*, J.J. Socha. The role of body shape change during landing in the flying snake *Chrysopelea paradisi*. Southeast Regional Society for Integrative and Comparative Biology Meeting, Atlanta, GA.

2013 Weiss, T.*, S. Jung, P.P. Vlachos, J.J. Socha. A kinematic analysis of water-surface locomotion in cricket frogs. Southeast Regional Society for Integrative and Comparative Biology Meeting, Atlanta, GA.

2013 Chattergee, S.*, J.J. Socha, M.A. Stremler. Mathematical Model of Mosquito Drinking: A Study of Sensitivity to Anatomical Variations. Southeast Regional Society for Integrative and Comparative Biology Meeting, Atlanta, GA.

2013 Pendar, H.*; J. J. Socha. The mechanism of tracheal collapse in beetles: a multi-linked system. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA.

2013 Tywman, C.*; J. J. Socha. How do flying snakes land on a branch? Kinematics and impact forces of landing in *Chrysopelea ornata*. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA.

2013 Aviles. J.*; H. Pendar; J. J. Socha. Flow control in darkling beetles: testing the compartmentalization hypothesis. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA.

2013 K. Greenlee; Socha, J.J.; Eubanks, H.B.; Lee W-K.; Kirkton, S.D.; Developmental changes in tracheal system structure and function in the caterpillar, *Manduca sexta*. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA.

2013 Harrison, J.F.; Waters, J.S.*; Cease, A.J.; Vandenbrooks, J.M.; Callier, V.; Klok, C.J.; Shaffer, K.; Socha, J.J.; How hoppers breathe. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA.

2012 Socha, J.J.; Kikuchi, K.; Chatterjee, S.*; Lee, W.-K.; Stremler, M.A.; Mochizuki, O. Do mosquitoes use more than one mode of drinking? An inside look at the pumps in the head. Society for Integrative and Comparative Biology Southeast Regional Meeting, Charleston, SC.

2012 Miller, L.*; Waters, J.S.*; Harrison, J.F.; Vandenbrooks, J.M.; Yager, D.D.; Xiao, X.; De Carlo, F.; Socha, J.J. The use of SR-μCT for 3D visualization of insect tracheal systems. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Giarra, M.N. *; Vlachos, P.P. ; Socha, J.J. Visualization of hemolymph flow in the heart of a cockroach. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Pendar, H.*; Beringer, D.; Socha, J.J. Collapse patterns of insect tracheal tubes under pressure. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Hochgraf, JS*; Socha, JJ. Does tracheal compression in carabid beetles function as a unidirectional pump? Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Roberts, C.*; Socha, J.J. Dynamics of the sucking pump in fluid feeding butterflies. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Kikuchi, K.; Chatterjee, S.*; Lee, W.-K.; Stremler, M.A.; Mochizuki, O.; Socha, J.J. Multi-modal pumping in drinking mosquitoes. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Dalton, E.*; Socha, J.J. The role of the abdominal pump in rhythmic tracheal compression in the ground beetle, *Pterostichus tristis*. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Harrison, J.F.*; Waters, J.S.; Heinrich, S.M.; Socha, J.J. Effects of rearing oxygen level on the anatomy of the adult tracheal system in *Drosophila*. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 Jafari, F.*; J.J. Socha. A theoretical investigation of static stability in gliding snakes. Society for Integrative and Comparative Biology Annual Meeting, Charleston, SC.

2012 De Vita, R., M.R. Webster*, J.J. Socha. Microstructural analysis of insect tracheal tubes, PACAM 2012, Trinidad, January 2-6, 2012.

2011 Giarra, M.N. *; Vlachos, P.P. ; Socha, J.J. Visualization of hemolymph flow in the heart of a cockroach. Society for Integrative and Comparative Biology Southeast Regional Meeting, Winston-Salem, NC.

2011 Dalton, E.*; Socha, J.J. Beetle Schwarzenegger's pumping iron: How insects pump and compress. Society for Integrative and Comparative Biology Southeast Regional Meeting, Winston-Salem, NC.

2011 Roberts, C.*; Socha, J.J. Dynamics of the sucking pump in a fluid-feeding butterfly. Society for Integrative and Comparative Biology Southeast Regional Meeting, Winston-Salem, NC.

2011 Chatterjee, S.*, J.J. Socha, M.A. Stremler. A numerical model of drinking by mosquitoes, Society for Engineering Science conference, Chicago, IL, Oct. 12-14, 2011.

2011 Aboelkassem, Y.*, A.E. Staples, J.J. Socha. Microscale flow pumping inspired by rhythmic tracheal compressions in insects. ASME 2011 Pressure Vessels and Piping Conference (PVP 2011), July 17-21, 2011, Baltimore, Maryland, USA.

2011 A. Salmanzadeh*, J.J. Socha, M.A. Stremler, and R.V. Davalos, Engineering Novel Insect Respiratory System-Inspired Microfluidic Systems. Virginia Tech-Wake Forest University 10th Annual Graduate Student Research Symposium, May 12, 2011.

2011 A. Salmanzadeh*, Y. Hosseini*, H. Pendar*, J.J. Socha, M.A. Stremler, and R.V. Davalos, Investigation of the Mechanisms of Flow Control in an Insect Respiratory System. 27th Annual GSA Research Symposium 2011, Blacksburg VA, March 23rd, 2011 (Received the 2nd Best Poster Award).

2011 J.J. Socha. Synchrotron x-ray imaging for studying insect form and function. Entomological Society of America, Eastern Branch, Harrisburg, PA. (Invited symposium talk.)

2011 J.J. Socha, F. Jafari*, P.P. Vlachos. Challenges of being a snake glider. Society for Integrative and Comparative Biology Annual Meeting, Salt Lake City, UT. (Invited symposium talk.)

2011 S.B. Dellinger*, P.P. Vlachos, R. De Vita, J.J. Socha. When gliding is a stretch: An investigation of material properties of 'flying' snake. Society for Integrative and Comparative Biology Annual Meeting, Salt Lake City, UT.

2011 L. Cox*, J.J. Socha. Patterns of hemolymph pressure in the thorax of a carabid beetle. Society for Integrative and Comparative Biology Annual Meeting, Salt Lake City, UT.

2011 F. Jafari*, J.J. Socha. Theoretical modeling of flying snakes glide trajectories. Society for Integrative and Comparative Biology Annual Meeting, Salt Lake City, UT.

2011 H. Pendar*, J.J. Socha. Do gut movements induce tracheal collapse in carabid beetles? Society for Integrative and Comparative Biology Annual Meeting, Salt Lake City, UT.

2011 A. Jamil, J.J. Socha, D.D. Yager. 3D reconstruction of tracheal systems in one-eared and two-eared praying mantises. Society for Integrative and Comparative Biology Annual Meeting, Salt Lake City, UT.

2010 E.A. Backus, W.-K. Lee, J.J. Socha, E. Lee*. Muscle movements that control inoculation of *Xylella fastidiosa* are revealed by head X-rays of feeding glassy-winged sharpshooters. Entomological Society of America 58th Annual Meeting, San Diego, CA.

2010 J.J. Socha, K. Miklasz*, F. Jafari*, P.P. Vlachos. Gliding flight in snakes: non-equilibrium dynamics and kinematics. APS Division of Fluid Dynamics Annual Meeting, Long Beach, CA.

2010 D. Holden*, P.P. Vlachos, J.J. Socha. Flying snake flight performance: Role of cross-sectional shape and orientation of tandem body segments. APS Division of Fluid Dynamics Annual Meeting, Long Beach, CA.

2010 L. Cox* and J.J. Socha. Patterns of hemolymph pressure in the thorax of a carabid beetle. Joint DCB/DVM Southeast Regional Conference of the Society of Integrative and Comparative Biology 2010, Virginia Tech, VA.

2010 H. Pendar* and J.J. Socha. Do gut movements induce tracheal collapse in carabid beetles? Joint DCB/DVM Southeast Regional Conference of the Society of Integrative and Comparative Biology 2010, Virginia Tech, VA.

2010 Y. Aboelkassem*, J.J. Socha, A.E. Staples. On the flow patterns induced by rhythmic compressions of an insect tracheal tube. Joint DCB/DVM Southeast Regional Conference of the Society of Integrative and Comparative Biology 2010, Virginia Tech, VA.

2011 S.B. Dellinger* and J.J. Socha. When gliding is a stretch: An investigation of material properties of 'flying' snake. Joint DCB/DVM Southeast Regional Conference of the Society of Integrative and Comparative Biology 2010, Virginia Tech, VA.

2011 S. Chattergee*, J.J. Socha, M. Stremler. Mathematical modeling of mosquito drinking. Joint DCB/DVM Southeast Regional Conference of the Society of Integrative and Comparative Biology 2010, Virginia Tech, VA.

2011 F. Jafari* and J.J. Socha. Theoretical modeling of flying snake glide trajectories. Joint DCB/DVM Southeast Regional Conference of the Society of Integrative and Comparative Biology 2010, Virginia Tech, VA.

2010 J.J. Socha, W.-K. Lee, L. Cox*. Under pressure: The biomechanical mechanism of rhythmic tracheal compression in carabid beetles. ASME Smart Materials, Adaptive Structures, and Intelligent Systems Conference, Philadelphia, PA.

2010 L. Cox* and J.J. Socha. Patterns of pressure in the thorax of a carabid beetle. ASME Smart Materials, Adaptive Structures, and Intelligent Systems Conference, Philadelphia, PA.

2010 M. Webster*, R. De Vita, J.N. Twigg*, J.J. Socha. Tensile properties of insect tracheal tubes, ASME Smart Materials, Adaptive Structures, and Intelligent Systems Conference, Philadelphia, PA.

2010 L. Cox*, J.J. Socha. The insect tracheal system as a microfluidic pump: A test of the hemolymph pressure hypothesis. Biomedical Engineering Society Annual Meeting, Austin, TX.

2010 Webster, M.R.*, J. Twigg, J.J. Socha, R. De Vita. Understanding the mechanics of the insect respiratory system could advance tissue engineering. Biomedical Engineering Society Annual Meeting, Austin, TX.

2010 J.J. Socha, L. Cox*, W.-K. Lee, M. Means*, J. Tolley*. Under pressure: the biomechanical mechanism of rhythmic tracheal compression in carabid beetles. Society for Integrative and Comparative Biology Annual Meeting, Seattle, WA. (talk canceled due to weather/travel problems)

2009 J.J. Socha and S. Robinson*. Do insects that breathe using convection optimize tracheal branching patterns? A test of Murray's Law in a carabid beetle. Joint DCB/DVM Southeast Regional Conference of the Society of Integrative and Comparative Biology 2009, Chapel Hill, NC.

2009 J.J. Socha. Minimization of energy loss in convective respiratory flows in insects? A test of Murray's law in a beetle tracheal system using synchrotron tomography. International Congress of Respiratory Biology, Bonn, Germany. (Invited symposium talk.)

2009 F.M. Davis, R. De Vita, J.J. Socha. A constitutive law characterizing the material response of insect trachea, 2009 Joint ASCE-ASME-SES Conference on Mechanics and Materials, Virginia Tech.

2009 J.F. Harrison, J.J. Socha, W.K. Lee. Visualizing and quantifying fluid flow and respiratory structures in insects. Advanced Photon Source Users Week 2009 conference, Argonne, IL.

2009 E. Lee*, A. Merkey, J.J. Socha, W.K. Lee, A. Gibbs, D. Hoshizaki. Functional analysis of tracheal development during metamorphosis. 50th Annual Drosophila Research Conference, Chicago, IL.

2009 W.K. Lee and J.J. Socha. Direct visualization of flow in the heart of a grasshopper. Society for Integrative and Comparative Biology Annual Meeting, Boston, MA.

2008 Miklasz*, K., M. LaBarbera, J.J. Socha. The effect of body cross-sectional shape on glide force production in 'flying' snakes. 22nd International Congress of Theoretical and Applied Mechanics, Adelaide, Australia.

2008 J.J. Socha and W.K. Lee. Direct visualization of flow in the heart of a grasshopper. Virginia Tech Fall Fluid Mechanics Symposium.

2008 W.K. Lee and J.J. Socha. Direct visualization of flow in the heart of a grasshopper. Virginia Tech/ Engineering Science and Mechanics 100th Anniversary Mechanics Conference.

2008 W.K. Lee and J.J. Socha. Direct visualization of flow in the heart of a grasshopper. Joint Southeast Regional Society for Integrative and Comparative Biology Meeting, Divisions of Vertebrate Morphology and Comparative Biomechanics. Clemson University.

2008 J.J. Socha. Bioinspiration from convective pumping in insect tracheal systems. ASME 2008 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems. Ellicott City, MD.

2008 J.J. Socha. Gliding flight in snakes. ASME 2008 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems. Ellicott City, MD.

2007 J.J. Socha, J.S. Waters, M.W. Westneat, M. LaBarbera, S. Cook, K. Fezzaa, W.-K. Lee. The Poise that refreshes: dynamics of internal food transport in a butterfly. Annual Meeting, Integrative and Comparative Biology.

2007 M.E. Hale, J.S. Waters*, W.-K. Lee, J.J.Socha, K. Fezzaa, M.W. Westneat. Drawing inspiration from insect breathing and heaving conventional wisdom: Convective tracheal and air sac mechanisms in Drosophila visualized with x-ray imaging. Annual Meeting, Integrative and Comparative Biology.

2007 J.J. Socha, K. Fezzaa, W.-K. Lee, F. De Carlo. The use of synchrotron x-ray microtomography for studies of fine-scale 3D morphology. Annual Meeting, Integrative and Comparative Biology.

2007 K. Miklasz*, J.J. Socha, M. LaBarbera. Understanding aerodynamic force generation in gliding snakes using physical models. Annual Meeting, Integrative and Comparative Biology.

2006 J.J. Socha, K. Fezzaa, W.-K. Lee, M.W. Westneat. The power of synchrotron x-rays for the study of respiratory form and function in insects. First International Conference of Respiratory Biology. (invited symposium)

2006 J.J. Socha, M.W. Westneat, W.-K. Lee. X-ray vision: The use of synchrotron radiation to study respiratory form and function in carabid beetles. International Meeting of Carabidologists.

2006 J.J. Socha, J.F. Harrison, W.-K. Lee, M.W. Westneat. Tubes squeeze and the air flows out: Correlated patterns of CO_2 emission and tracheal compression in the beetle, *Platynus decentis*. Annual Meeting, Integrative and Comparative Biology.

2006 J.S. Waters*, J.J. Socha. Mechanics of tracheal compression in the bessbug, *Popilius disjunctus*. Annual Meeting, Integrative and Comparative Biology.

2006 K. Miklasz*, J.J. Socha. Mathematical modeling of flying snake kinematics during gliding locomotion. Annual Meeting, Integrative and Comparative Biology.

2006 C.J. Klok, A. Kaiser, B. McKinley, B. Rascon , J. Henry, W.-K. Lee, J.J. Socha, J.F. Harrison. Plastic and evolutionary responses of body size and tracheal dimensions to atmospheric oxygen concentration in fruitflies. Annual Meeting, Integrative and Comparative Biology.

2005 J.J. Socha, M.W. Westneat, W.-K. Lee. Use of synchrotron x-rays for live-insect internal imaging. Annual Meeting, Entomological Society of America.

2005 J.J. Socha, K. Fezzaa, W.-K. Lee, J.S. Waters, M.W. Westneat. Tracheal compression patterns involved in gas exchange in the ground beetle, *Platynus decentis*. Advanced Photon Source Annual Users Meeting. (poster)

2005 J.J. Socha, K. Fezzaa, W.-K. Lee, J.S. Waters, M.W. Westneat. 2004. Tracheal compression patterns involved in gas exchange in the ground beetle, *Platynus decentis*. Annual Meeting, Society for Integrative and Comparative Biology.

2004 J.J. Socha, M.W. Westneat, W.-K. Lee. Beetle respiration mechanics analyzed with synchrotron x-ray radiation. Annual Meeting, Society for Integrative and Comparative Biology.

2003 J.J. Socha. The timing and shape of dorsoventral flattening in *Chrysopelea paradisi*, a gliding snake. Annual Meeting, Society for Integrative and Comparative Biology. (poster)

2002 J.J. Socha, T. O'Dempsey. A three-dimensional analysis of snake flight. Annual Meeting, Society for Integrative and Comparative Biology.

2000 J.J. Socha. A preliminary 3-D analysis of flying snake flight (Colubridae: *Chrysopelea*). 5th Graduate Congress, National University of Singapore.

2000 J.J. Socha. The take-off and landing kinematics of a flying snake, *Chrysopelea ornata*. Annual Meeting, Society for Integrative and Comparative Biology.

1999 J.J. Socha. A description of flight kinematics in the 'flying' snake, *Chrysopelea paradisi*. Annual Meeting, Society for Integrative and Comparative Biology.

1998 J.J. Socha. A description of flight in the flying snake, *Chrysopelea paradisi*. Annual Meeting, American Society of Ichthyologists and Herpetologists.

Outreach

2015, 17, 18, 23 Interactive exhibit on animal biomechanics, **Virginia Science Festival**, Virginia Tech

2017 Presenter, "To catch a flying snake," **Science on Tap**, November 27, Blacksburg, VA

2016-present Laboratory participant, **National Biomechanics Day**, Virginia Tech

2014, 17-19 Interactive exhibit on the biomechanics of insects, **Hokie Bugfest**, Virginia Tech

2014-2019 Co-founder and Director, **NSF RET (Research Experiences for Teachers) program**, Virginia Tech

2012-2014 Founder and Director, **NSF EFRI-REM program (Emerging Frontiers for Research and Innovation, Research Experience and Mentoring)**, Virginia Tech

2009-present Lab tours, **ESM, BEAM, ME, COE**, Virginia Tech

2009-present Presenter, **Center for Enhancement of Engineering Diversity (CEED) programs (C-Tech^2, Imagination)**, Virginia Tech

1999-2008 Founder and Director, **Bio Outreach program**, University of Chicago

2006-2008 IT Director, **Polaris Charter Academy** (K-8 Chicago Public School)

2005-2006 Member, **Global Village program** (Oak Park, IL public school program that partners teachers with scientists)

2004 Exhibitor, **Member's Night**, Division of Amphibians and Reptiles, Field Museum

2003-2004 Saturday School instructor, **KIPP Ascend Charter School**, Chicago

2001-2002 Learning Team Leader, **Teach For America**, Chicago

2000-2001 Guest Lecturer, **University of Chicago Summer Science program** for Chicago public school students

1997-2005 Science fair judge, **Chicago Public Schools City Science Fair**
1996-1997 Member, **Partners for Science program**, University of Chicago
1994-1996 Corps Member, **Teach for America** national teacher corps

Public Dissemination of Research

Television

- Scientific consultant for a documentary by Saint Thomas Productions entitled "A New Prehistory" in the episode "What killed the giant insects?"
- Scientific consultant for a BBC documentary focused on animal flight called "SuperNature: Wild Flyers". The episode "Defying Gravity" includes one segment on flying snakes and an end "making of" segment that highlights our efforts to film the snakes in Sabah, Malaysia. This program premiered in 2016 on PBS and BBC worldwide.
- Scientific consultant and subject of an hour-long documentary entitled, "Snakes That Fly." Film centers on animal gliders of Southeast Asia, and focuses specifically on Socha's March 2010 field work in Penang, Malaysia with flying snakes. Broadcast debut worldwide on *National Geographic Television* on November 5, 2010.
- Research featured in two *History Channel* programs, "Evolve" (episode 8, "Size") and "Prehistoric Monsters Revealed", highlighting insect x-ray work at Argonne National Laboratory. Each included interviews of Socha and was broadcast in 2008.
- Subject of full-feature episode of December 2003 field work: Snake Wranglers 2, Episode 10: "Flying Snakes." First aired on *National Geographic Television* March 21, 2004.
- Television highlights of flying snake research have been featured in programs such as *CNN*'s Headline News, *CNN*'s "next@cnn" weekly science program, *National Geographic Television*, *Discovery Channel Canada*'s "Daily Planet", *ABC Channel 7 News* (Chicago), *CLTV* (Chicago), and *CBS WTKR News 3* (Virginia Beach).

All media

2025

Watch a frog walk on water with high-speed belly flops. By Rohini Subrahmanyam, Scientific American, January 30, 2025.
Cricket frogs belly flop their way across water. By McKenzie Prillaman, Science News, January 27, 2025.
This frog is in its belly flop era. By Sabrina Imbler, Defector, January 24, 2025.
Hilarious 'fast-moving belly flop' lets frogs walk on water. By Michelle Starr, ScienceAlert, January 13, 2025.
Cricket frogs can literally walk on water as if it were dry land. By Sanjana Gajbhiye, earth.com, January 10, 2025.
Watch frogs fling themselves across the water's surface – one impressive belly flop at a time. By Eleanor Higgs, IFLScience, January 10, 2025.
A fast-moving belly flop: Researchers unveil the unique skills of cricket frogs. By Alex Parrish, Virginia Tech, January 6, 2025.

2024

How do snakes fly? By Hannah Thomasy, The Scientist, December 16, 2024.

Research experience powers relationships with historically Black colleges and universities. By Lexi Clatterbuck, Virginia Tech, November 11, 2024.

2023

Could the science behind flying snakes help create flying robots? By Roxy Todd, Radio IQ, NPR, February 9, 2023.

2021

Brood X cicadas are busy and so are the scientists who study them. By Nell Greenfieldboyce, All Things Considered, NPR, May 25, 2021.
Latch, load and release: Advanced Photon Source helps reveal elastic motion that makes click beetles click. Newswise. February 1, 2021.
Spring and latch mechanism flings click beetles into the air. Michael Allen, physics world. January 29, 2021.
Nature uses springs and latches to overcome the limitations of muscles. By Sandy Field, APS Science Highlight. January 28, 2021.
Mechanism that produces rapid acceleration in clicking beetles identified. By Laura McWhinney, EurekAlert. January 21, 2021.
Video: One of nature's most deceptive insects is helping build a better robot. By Sarah Wells, Inverse, January 19, 2021.
Interdisciplinary team identifies mechanism that produces rapid acceleration in clicking beetles. By LauraMcWhinney, Virginia Tech press release. January 18, 2021.
Latch, load and release: Elastic motion makes click beetles click, study finds. EurekaAlert. January 18, 2021.

2020

Flying snakes? Here's how they can glide through the air. By Jack Guy, CNN, July 30, 2020.
How do flying snakes glide through the air? 'It's hard to believe'. By David Waldstein, New York Times, July 29, 2020.
How flying snakes stay stable while gliding through the air. By Shamini Bundell, Nature Video, July 29, 2020.
How snakes fly (hint: it's not on a plane). By Nell Greenfieldboyce, All Things Considered, NPR, July 29, 2020.
Flying snakes wiggle their bodies to glide down smoothly from trees.By Donna Lu,New Scientist, July 29, 2020.
Here's how flying snakes stay aloft.By Emily Conover,Science News, July 29, 2020.
Did you know flying snakes existed?By Amanda Arnold,The Cut, New York magazine, July 2, 2020.
Undulating their bodies keeps flying snakes from tumbling out of control.By Jennifer Ouellette,ars Technica, July 2, 2020.
New 3-D model shows how the paradise tree snake uses aerial undulation to fly. EurekAlert, June 29, 2020, Phys.org, June 29, 2020.
Scientists use 3D modeling to find out how this snake can fly. By Daisy Hernandez, Popular Mechanics, July 26, 2020.
Here's How Snakes Fly Through the Air | #ScientistFridays.By Nicole O'Brien,Discovery Canada, July 24, 2020.
How snakes fly. Flying snakes are able to glide across the air like acrobats. Here's how they do it.By Nikolay Nikolov and Emmett Smith,mashable.com, July 22, 2020.
Researchers use 3D modeling to decode aerial undulation's role in flying snake glides.Press release by Suzanne Irby, Virginia Tech, June 26, 2020.
Gravity affects insect blood flow like in humans, says study with Virginia Tech ties.By Henri Gendreau,Roanoke Times, January 24, 2020.

How grasshoppers deal with blood rushing to their heads.By Nicholas Gerbis,91.5 KJZZ, January 17, 2020.
Scientists put grasshoppers in a linear accelerator to see what happens when they're upside down.By Kristy Hamilton,IFL Science, January 17, 2020.
Like humans, grasshoppers grapple with gravity's effects on blood pressure.By Katherine J. Wu,Smithsonian Magazine, January 14, 2020.
How insects cope when blood rushes to their heads. By James Gorman, New York Times, January 13, 2020.
How do X-ray images helped reveal insects' physiological responses to gravity? EurekAlert, January 13, 2020, Phys.org, January 13, 2020.
ASU researcher unlocks mysteries of grasshopper response to gravity. Press release by Melinda Weaver, ASU, January 13, 2020.
X-ray images help reveal insects' physiological responses to gravity. Press release by Laura Weatherford, Virginia Tech, January 13, 2020.

2018

Research on how mosquitoes drink could yield new efforts to control the spread of disease.By Todd Corillo. Story and television interview (WTKR, Virginia Beach, VA) of Dr. Jake Socha, June 22, 2018.
How mosquitoes drink and why it matters. Radio interview (WINA, Charlottesville, VA) of Dr. Jake Socha, March 26, 2018.
Argonne's X-rays used to identify new mode of drinking in mosquitos. Technology.org, March 23, 2018.
The science behind torturing mosquitoes. By Mike Wehner, New York Post, March 21, 2018. Originally published in BGR.
Discovered mode of drinking in mosquitoes carries biomedical implications. Science Newsline, March 21, 2018.EurekAlert,March 20, 2018, Science Daily,Phys.org, March 20, 2018.
Mosquitoes drink with a burst in reserve. Science highlight by the Advanced Photon Source, Argonne National Laboratory, March 20, 2018.
Newly discovered mode of drinking in mosquitoes carries biomedical implications.Press release by Emily Roediger, Virginia Tech, March 20, 2018.
Video: Interview with Dr. Jake Socha on new mosquito research. Produced by Emily Roediger, Virginia Tech, March 19, 2018.

2017

A New Prehistory television episode, "What killed the giant insects?" Produced by Emma Baus and Saint Thomas Productions.

2016

SuperNature: Wild Flyers television episode 1, "Defying Gravity". Produced by Dr. Simon Bell. Premiered on PBS on June 29, 2016. Blog item.
Slithering to fly. By Lindsay Key, BIOTRANS magazine, June 2016.
2015
Fluid dynamics on four legs: The brilliance of how dogs drink. By Sean Greene, LA Times, December 18, 2015.
Ever think about the difference in how dogs and cats drink water? By Robbie Harris, NPR, December 2015.
Virginia Tech researchers learn how a dog drinks water. By Rick Pantaleo, VOA, December 14, 2015.
To Breathe, Immature Beetles Flex Their Abs Like Belly Dancers. By Janet Fang, June 23, 2015.
Video: Young beetles pump their abs to breathe. By Juan David Romero, Science, June 22, 2015.

2014

Flying Snake Morphs into UFO Shape to Glide. By Tia Ghose, Livescience.com, January 29, 2014.
Zoologger: Flying snake gets lift from UFO cross section. By Sandrine Ceurstemont, NewScientist, January 29, 2014.
Watch Tree Snakes Fly: They Don't Need a Plane. By Rebecca Boyle, Popular Science, January 30, 2014.
Secrets of Flying Snakes Revealed. By Rebecca Morelle, BBC, January 30, 2014.
Ophidiophobics beware: flying snakes have great aerodynamics. By Will Dunham, Reuters, January 30, 2014.
Biologists Offer Insights into Flight of Paradise Flying Snake. Sci-News.com, January 30, 2014.
Daily Planet television segment. An interview on flying snake research, by the Daily Planet on Discovery Channel Canada,February 2014.
UFO cross-section gives snakes a lift. By Lynn Nystrom, Virginia Tech press release, February 03, 2014.
Science Take: Flying Snakes. By David Frank and James Gorman, The New York Times, February 19, 2014.
Eek! Snakes can fly!By Tamara Dietrich, Daily Press, March 06, 2014.
The Elegant Secrets of Flying Snakes. By Linton Weeks, NPR, March 07, 2014.
Researchers closing in on solving mystery of how some snakes fly. By Meeri Kim, The Washington Post, March 09, 2014.
Serpentine Style: The Physics of Flying Snakes. By Jennifer Ouellette, Scientific American, March 14, 2014.
Flying Snakes May Inspire Future Gliding Suits. By Katia Moskvitch, Livescience.com, April 01, 2014.
Video: Why dogs are such sloppy drinkers. By David Shultz, Science, November 24, 2014.
Physicists study why dogs are sloppier drinkers than cats. NBC News, November 25, 2014.
Video Feature: For Dogs, an Eight G Water Break. By David Frank and James Gorman, The New York Times, December 08, 2014
How flying snakes fly. Science 2.0, December 30, 2014

2013

How do snakes fly? Just ask your favorite graphics chip. By Robert McMillan, Wired, October 31, 2013.
Mimicking nature in engineering. By Lynn Nystrom, Virginia Tech, February 19, 2013.
Nature's phenomena might teach Virginia Tech engineers new tricks. By Lynn Nystrom, Virginia Tech, February 28, 2013.

2012

Snakes that fly – really. TEDx Talk by Jake Socha, TEDx Virginia Tech, December 06, 2012.

2010

The following are all related to our work on flying snake gliding flight:
Pentagon seeks flying snakes' secret. By Marc Kaufman, The Washington Post, November 22, 2010.
Note that the statement "It allows them to travel from the top of the biggest trees in the region (almost 200 feet high) to a spot about 780 feet away from the tree's trunk." may be misleading if read incorrectly. This statement refers to the possibility that the snakes can glide this far. I provided Mr. Kaufman that figure as a hypothetical, calculated by extrapolating my published data: If the snake jumped from a tree roughly 60 meters high (197 ft) and traveled at a glide angle of 13°, it would cover roughly 237 m (778 ft) horizontally. No real flying snake has ever been observed gliding this far.
Flying snakes' secret revealed. By Stephanie Pappas, Livescience.com, November 22, 2010. Also found at MSNBC.com and foxnews.com, among others.
How snakes can fly. By Ker Than, National Geographic Daily News, November 23, 2010.
Flying snakes, caught on tape. From the AIP press release (written by Kathy Svitil) on PhysOrg.com, November 23, 2010.

Video reveals how a flying snake slithers through the air. By Jennifer Walsh, Discover magazine 80beats blog, November 23, 2010.
NPR All Things Considered. Interview on NPR by Mary Louise Kelly, November 24, 2010.
Sakes Alive! Snakes That Fly! By Mark Memmott, NPR "The Two-Way", November 24, 2010.
Daily Planet television segment. An interview on flying snake research, by the Daily Planet on Discovery Channel Canada, November 24, 2010.
Video: See snakes fly: Virginia Tech researchers are learning how the reptiles are able to glide so gracefully to the ground. By Jef Akst, The Scientist, November 24, 2010.
Flying ophidians! Physicists uncover how snakes soar between trees. By Katherine Harmon, Scientific American online, November 24, 2010.
(Note: none of us are actually physicists--of the four of us on the paper, two are biomechanists and two are engineers. I imagine physicists rolling their eyes, while we are complimented.)
Pentagon wants secret of flying snakes. By Lee Speigel, AolNews, November 24, 2010.
It's a bird. It's a plane. No, it's a flying snake. By Sindya Bhanoo, The New York Times, November 29, 2010.
(Note: Snakes were not 'thrown' from the tower. They launched under their own volition. See the journal article here.)
Aerodynamics of flying snakes. An online video piece by Reuters television produced by Marie Lora, December 2, 2010.
Snakes with no #&%*$$!! plane! An interview on the CBC Radio program Quirks and Quarks with Bob McDonald, December 4, 2010. Listen here.
The Conversation: Flying snakes? An online interview with ABC News Video, December 7, 2010. (Note: they edited out Dr. Robert Dudley's name, the professor I mentioned as my source of inspiration.)
A new, one hour film by National Geographic on gliding snakes and colugos:
"Snakes That Fly" This program debuted on the National Geographic Channel on November 5, 2010, part of the series "Nature Untamed". The other researcher in the film is Norman Lim, who was one of my original flying snake team members from my research in Singapore in the early 2000's. Norman went on to study the ecology of colugos and is currently a graduate student at UC Davis.
The following are all related to the work on caterpillar locomotion:
Caterpillar crawl could inspire new robots. By Roseanne Skirble, Voice of America, July 29, 2010. Listen to the audio story here.
Caterpillars' gut-sliding locomotion inspires soft-bodied robot development. By Ben Coxworth, gizmag.com, July 27, 2010.
New insight into a caterpillar's crawl. By Kenneth Chang, The New York Times, July 26, 2010.
Studying caterpillars to design robots. By Carolyn Y. Johnson, The Boston Globe, July 26, 2010. (Note: Dr. Socha's PhD advisor, Dr. Michael LaBarbera, is quoted.)
Gut check: how do caterpillars walk? By Geoffrey Brumfiel, NPR Morning Edition, July 23, 2010. Listen to the audio story here. Dr. LaBarbera gets a nice audio quote.
'Soft robots' will use gut-wrenching propulsion method: Bowel-churning caterpillar boffinry breakthrough. By Lewis Page, The Register, July 23, 2010. Notable for usage of 'boffins' and 'squidgy'.
Gut movements in caterpillars have impact on robotic design. By Lynn Nystrom, Virginia Tech press release, July 22, 2010. (Eureka Alert version of this story)
Caterpillars move guts-first. By Jennifer Viegas, Discovery News, July 22, 2010.
Gut first. By Rachel Ehrenberg, Science News, July 22, 2010.
Insect gut has mind of its own. Christina Luigi, The Scientist, July 22, 2010. Also quotes Dr. LaBarbera.
ScienceShot: Caterpillar's guts crawl independently of their bodies. Kristen Minogue, Science, July 22, 2010.

Unique means of animal locomotion reported for first time: Novel "two-body" system in caterpillars could have implications for robotics, human biomechanics. By Kim Thurler, Tufts University press release, July 22, 2010.

2009

Bring fruit flies in from the cold. From the U. Western Ontario press release, plus other links to stories. December 21, 2009.
The secrets of the lowly ground beetle could lead to better tissue engineering. By Lynn Nystrom, Virginia Tech press release, September 3, 2009.

2007

Why today's bugs aren't giant-sized. By Robin Lloyd, livescience.com, August 14, 2007.
Giant bugs a thing of the past, study suggests. By Hope Hameshige, National Geographic News, July 30, 2007.
A complicated way of breathing. By Stefan Anitel, Softpedia News, May 18, 2007.
Beetle breathing highly complex, study finds. By Jeanna Bryer, livescience.com, May 17, 2007.

2005

Look ma, no wings. Reader's Digest Canada magazine, October 2005. p. 18.
Journal Science "Netwatch" feature (pdf). Science 309:361, July 15, 2005.
Those amazing young snakes are flying machines. By Lynn M. Savage, Biophotonics International magazine, July 2005, pp. 86-87.
Audio: KW Magazine interview (FM 98.5 Waterloo, ON, Canada). KW Magazine. 8 min 47 sec, 6 mb mp3.
Audio: 848 interview (Chicago Public Radio). Interviewer is Gianofer Fields, WBEZ Chicago, 848. 15 min 15 sec, 14.5 mb mp3. (Link directly to 848's site is here; scroll down to 'Flying snakes'.)
It's a bird, it's a plane, it's a snake! By Lee Dye, abcnews.com, May 19, 2005.
Daily Planet television segment. An interview on flying snake research by the Daily Planet on Discovery Channel Canada,May 18, 2005.
University of Chicago researchers reveal secrets of snake flight. By Catherine Gianaro, University of Chicago press release, May 13, 2005.
Flying snakes: new videos reveal how they do it. By Bjorn Carey, livescience.com, May 12, 2005.

2004

Snake Wranglers II: Flying Snakes. National Geographic Television. First broadcast, March 2004. A half-hour program about on flying snake research.

2003

Serpents in the air (a little contortionist goes a long way). By Adam Summers, Natural History magazine, May 2003. pp. 38-39.

2002

Expert tackles mysteries of soaring snakes. By Nancy Moffett, Chicago Sun-Times, December 24, 2002.
When snakes fly. By Henry Fountain. The New York Times, August 13, 2002.
Remarkable wingless aeronautics. The Economist, August 10, 2002.
Slithering on Air: Flying snakes glide through the treetops. By Kristin Cobb. Science News, Aug. 10, 2002.
Tropical snake flies from trees. By Al Swanson, UPI. August 8, 2002.
Where serpents go soaring. By Jim Ritter. Chicago Sun-Times, August 8, 2002
New snake footage uncoils mystery of flying serpents. By John Roach. National Geographic News, August 8, 2002.

Flying snakes slither through the air. By Ann Kellan. Broadcast on CNN and CNN.com, August 8, 2002.
Tired of walking fish? Try flying snake. cbsnews.com (Reuters), August 8, 2002.

General features:
National Geographic flying snake profile
Seed magazine photography profile: "Jake's flying snakes".

Museum Exhibition of Scientific Photography

- *Flug der Nature* exhibit, April 29, 2004-?, Art Kite Museum, Detmold, Germany.