

CURRICULUM VITAE (abbreviated)

Personal Information

Name: J Scott Turner
Birthdate: 11 August 1951
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Degrees Conferred

Doctor of Philosophy 1982.

Department of Zoology and Entomology, Colorado State University.

Dissertation title: *The relationship between heat exchange and blood flow in reptiles.*

Advisor: Dr C R Tracy.

Master of Science 1979.

Department of Zoology and Entomology, Colorado State University.

Bachelor of Arts 1976.

College VIII, University of California, Santa Cruz.

Honors and awards

Purpose and Desire is awarded the **2018 Nautilus Book Award. Gold** in the category Science and Cosmology.

Purpose and Desire was granted the prestigious starred award from Kirkus Review (2017).

Inclusion of Essay *Signs of Design* in the compilation **Best Americian Spiritual Writing of 2008**. Jimmy Carter and Philip Zaleski (ed). Houghton-Mifflin.

Distinguished Teacher Award (ESF Undergraduate Student Association, 2004)

World's Top Twelve Researchers in Biomimicry (nomination). (Biomimicry Institute and Zero Emissions Research Group, 2008)

Senior Award for Excellence in Research (Sigma Xi, Syracuse Chapter, 2003)

Positions Held

In January 2022, I joined the National Association of Scholars as their Director of the Diversity in the Sciences project.

Since August 2019 I have been Emeritus Professor of Biology, retired from the SUNY College of Environmental Science and Forestry (SUNY ESF), in Syracuse, New York.

I came to SUNY ESF as an assistant professor in 1990, was promoted to associate professor in 1995, and in full professor in 2009.

I have also held various temporary appointments. In 2010, I was a visiting scholar in the Department of Earth sciences at Cambridge University. In 2017, I was a resident fellow at the Stellenbosch Institute for advanced study in Stellenbosch, South Africa.

After receiving my PhD, I enjoyed various short postdoctoral stints at Duke University (with Prof Knut Schmidt-Nielsen), the University at Buffalo Medical School (with Profs Hermann Rahn and Charles Paganelli), Franklin and Marshall College (visiting instructor), the University of Cape Town (with Profs Gideon Louw and Roy Siegfried), and the University of Bophuthatswana in South Africa, now the University of the North West, in Mafikeng / Mmabatho.

Learning and teaching

I am retired, and am no longer a classroom teacher. Nevertheless, I remain a teacher at heart. Presently, all my teaching is done through online courses, available at [udemy.com](https://www.udemy.com).

Physics of Life.

[*Thermodynamics*](#)

[*Biomechanics*](#)

[*Fluids*](#)

[*Wave phenomena*](#)

Animal Physiology.

[*Respiration & gas exchange*](#)

[*Blood, circulation & gas exchange*](#)

[*Digestion & metabolism*](#)

[*Temperature, heat & water balance*](#)

[*Biophysical Field Methods*](#), (with Prof Berry Pinshow, Ben-Gurion University of the Negev, Israel.

[*A primer on symbiosis.*](#)

[*A primer on social insects.*](#)

Media

I have produced an extensive library of media, including video, photography, and music, which can be found on the [media](#) page of my [website](#). Much of this is for educational media, listed above. Other media include public service productions for my local school district and arts council, as well as other more artistic productions. You can see a showcase of these [here](#). More video productions can be found on my [vimeo channel](#).

I am the informal webmaster for a remote desert research station in Namibia: [Gobabeb](#), Namib Research Institute. As part of my work with Gobabeb, I have been undertaking various media productions intended to increase their web presence. See showcases for [Paleoclimates](#), and [What's happening at Gobabeb?](#)

I also maintain a [YouTube channel](#), which features many playlists, including my developing video series on [Evolution](#), samples from my various online courses that are available for purchase through [udemy.com](https://www.udemy.com), as well as various other media development projects

Representative Invited Presentations (since 2015)

- Homeostasis as an organizing principle of social cognition.** Janelia Conference on Collective Computation in Biological and Artificial Systems. Howard Hughes Medical Institute. 19 March 2018. ([presentation link](#)).
- Evolution as cognition.** California Institute of Integral Studies, San Francisco, California. 10 January 2018. ([presentation link](#)).
- Thinking, not just selecting genes.** Fellows Seminar. Stellenbosch Institute for Advanced Study, Stellenbosch, South Africa. 18 July 2017. ([News link](#))
- Do we have evolution right? Book launch: Purpose and Desire by J Scott Turner.** Stellenbosch Institute for Advanced Study, Stellenbosch, South Africa. 17 August 2017. ([News link](#)).
- Evolution as cognition.** Invited presentation to the Department of Zoology and Entomology, University of Pretoria. 25 May 2017.
http://prezi.com/w5rt7sftwhg5/?utm_campaign=share&utm_medium=copy
- Insect-built structures and swarm cognition.** Invited presentation to the International Congress of Entomology Symposium on Excavation and Construction by Social Insects. 29 September 2016.
- Animal cities.** Invited presentation to the workshop on Nature-inspired urbanism, University College London Centre for Nature-Inspired Design. 14 December 2016.
https://prezi.com/8ei9to24v6zi/?utm_campaign=share&utm_medium=copy&rc=ex0share
- Homeostasis, adaptation and the problem of biological design.** Invited presentation to the workshop on Architecture and Collective Behavior. Arizona State University, Tempe, Arizona. 5-7 October 2016.
http://prezi.com/jtgioetfxnum/?utm_campaign=share&utm_medium=copy
- What's so inspiring about life? Physiomimetics, adaptation and persistence in harsh environments.** Invited presentation to NASA Biomimicry Summit and Education Forum 2016, Ohio Aerospace Institute, Cleveland, Ohio. 2-4 August 2016.
http://prezi.com/atoldtci6gty/?utm_campaign=share&utm_medium=copy
- Homeostasis and the physiological dimension of niche construction.** Invited presentation to the conference on Niche Construction. Santa Fe Institute, Santa Fe, New Mexico.
http://prezi.com/qqonwqjmuynp/?utm_campaign=share&utm_medium=copy&rc=ex0share

Publications

Books

J S Turner. 2017. *Purpose and Desire. What Makes Something “Alive” and Why Modern Darwinism Fails to Explain It.* HarperOne. San Francisco.
(winner of the 2018 Nautilus Book Award, Gold in Science and Cosmology).

J S Turner. 2007. *The Tinkerer’s Accomplice. How Design Emerges from Life Itself.* Harvard University Press. 282 pp.
<http://www.esf.edu/efb/turner/tinkerersaccomplice.html>

J S Turner. 2000. *The Extended Organism. The Physiology of Animal-Built Structures.* Harvard University Press, Cambridge, MA. 234 pp.
<http://www.esf.edu/efb/turner/extendedorganism.html>

Online courses

J S Turner. 2014. *Animal Physiology.* 1. Respiration and Gas Exchange: [Link](#); 2. Blood Circulation and Gas Exchange: [Link](#); 3. Digestion and Metabolism: [Link](#); 4. Temperature, Heat and Water Balance: [Link](#)

J S Turner and Berry Pinshow. 2015. *Biophysical Field Methods.* Methods and principles for the physical ecology of harsh environments. Coupled with the field course *Biophysical Ecology in the Namib.* [Link](#)

J S Turner. 2017. *Physics of Life.* 1. Thermodynamics: [Link](#); 2. Biomechanics: [Link](#); 3. Fluids: [Link](#); 4. Wave phenomena: [Link](#)

Popular articles, book reviews etc (since 2008).

J S Turner. 2022. How accreditation forces DEI ideology into STEM education. *RealClearScience.* [Link](#).

J S Turner. 2022. HBCUs chasing the research dollars. *National Association of Scholars.* [Link](#).

J S Turner. 2022. Biden’s science advisor falls to the woke. *The Spectator.* [Link](#).

J S Turner. 2022. Too many scientists spoil the job market. *The Spectator.* [Link](#).

J S Turner. 2022. Jordan Peterson and the crisis of totalitarian academic. *The Spectator.* [Link](#).

J S Turner. 2021. Modern science’s broken bargain. *The American Mind.* [Link](#).

J S Turner. 2021. The brainworms come for Big Science. *The American Mind.* [Link](#).

J S Turner. 2020. The self-inflicted decline of science and the academy. *National Review* September 24, 2020. [Link](#).

J S Turner. 2020. Science and the decline of the American academy. *Heritage Foundation First Principles*, 27. [Link](#)

J S Turner. 2020. The physiology and biophysics of respiratory therapy. *Inference: International Review of Science. Special Reports.* [Link](#).

J S Turner. 2020. Antimalarial drugs as COVID-19 therapy. *Inference: International Review of Science Special Reports.* [Link](#).

J S Turner. 2014. People. Interview with Scott Turner. *Zygote Quarterly* 8. Winter 2013/2014. pp. 60-71.

- J S Turner.** 2014. Book review: *Comparative Biomechanics: Life's Physical World*, 2nd edition. Steven Vogel. *American Journal of Physics* 82(3): 531-532.
- J S Turner.** 2012. The thermodynamics of life. Book review. *Work Meets Life . The Integrative Study of Work in Living Systems*. Robert Levin, Simon Laughlin, Christina de la Rocha and Alan Blackwell (eds). 2011. *Metascience* 21 (2): 371-373.
- J S Turner.** 2010. Dirt lungs. *Natural History*. 19 (2): 248.
- J S Turner.** 2008. Signs of design. *The Best American Spiritual Writing of 2008*. Jimmy Carter and Philip Zaleski (ed). Houghton-Mifflin, New York.
- J S Turner.** 2008. *Termites. Friend or Foe?* Pamphlet for the series *Spotlight on Agriculture*. Ministry of Agriculture. Republic of Namibia. In press.
- J S Turner.** 2008. *Nature's awful beauty*. Book review. *Built by Animals. The Natural History of Animal Architecture*. Mike Hansell. *American Scientist*. 96(2): 158-159.

Review articles (since 2008)

- Margaret Bryant, **Scott Turner.** 2019. From thermodynamics to creativity: McHarg's ecological planning theory and its implications for resilience planning and adaptive design. *Socio-Ecological Practice Research* 1 (1)
DOI: [10.1007/s42532-019-00027-1](https://doi.org/10.1007/s42532-019-00027-1)
- J S Turner.** 2019. Homeostasis as a fundamental principle for a coherent theory of brains. *Philosophical Transactions of the Royal Society of London B*. In press.
- J S Turner.** 2018. Many little lives. *Inference: International Review of Science* 4 (4): <http://inference-review.com/article/many-little-lives>.
- Penn, Alan and **J S Turner.** 2018. Can we identify general architectural principles that impact the collective behavior of both human and animal systems? *Philosophical Transactions of the Royal Society B*. 373 (1753): 20180253.
- J S Turner.** 2017. Swarm cognition and swarm construction. Lessons from a social insect master builder. In: J Portugali and E Stolk (eds.) *Complexity, Cognition, Urban Planning and Design*. Springer-Heidelberg.
- J S Turner.** 2016. Semiotics of a superorganism. *Biosemiotics*. 9 (1) (March)
DOI: 10.1007/s12304-016-9256-5.
- J S Turner.** 2016. Homeostasis and the physiological dimension of niche construction theory in ecology and evolution. *Evolutionary Ecology*. 30 (2), 203-219.
- J S Turner** and B Pinshow. 2015. Transient-state mechanisms of wind-induced burrow ventilation. *Journal of Experimental Biology* 218 (2): 170-175.
- J S Turner.** 2013. Homeostasis and the forgotten vitalist roots of adaptation. Ch 11 in: *Vitalism and the Scientific Image in Post-Enlightenment Life Science 1800-2010*. . S. Normandin and C. T. Wolfe (eds). Heidelberg, Springer. pp. 271-291.
- J S Turner.** 2013. Superorganisms and superindividuality. The emergence of individuality in a social insect assemblage. In: Frédéric Bouchard and Philippe Huneman (eds). *From Groups to Individuals. Perspectives on Biological Associations and Emerging Individuality*. The Vienna Series in Theoretical Biology. MIT Press. pp 219-241

- J S Turner.** 2013. Biology's second law. Homeostasis, purpose and desire. In: B. G. Henning and A. Scarfe. (eds). *Beyond Mechanism. Putting Life Back into Biology.* Lexington Books/Rowman & Littlefield. pp 183-203
- J S Turner.** 2012. Evolutionary architecture? Some perspectives from biological design. *Architectural Design* 82(2): 28-33.
- Odling-Smee, J and **J S Turner.** 2012. Niche construction theory and human architecture. *Biological Theory* 6 (3): 283-289. DOI 10.1007/s13752-012-0029-3
- J S Turner.** 2011. Termites as models of swarm cognition. *Swarm Intelligence.* 5(1): 19-43
- J S Turner** and R C Soar. 2010. Beyond biomimicry. What termites can tell us about realizing the living building. Chapter 15 in: *Industrialised, Integrated, Intelligent sustainable Construction.* ISBN 978-0-86022-698-7. Ian Wallis, Lesya Bilan, Mike Smith & Abdul Samad Kazi (eds). I3CON/BSRIA. London.. pp 233-248.
- J S Turner** and R C Soar. 2008. Beyond biomimicry. What termites can tell us about realizing the living building. *Proceedings of the First International Conference on Industrialized, Integrated, Intelligent Construction.* Loughborough University, 14-16 May 2008.
- J S Turner.** 2008. Homeostasis, complexity, and the problem of biological design. *Emergence: Complexity and Organization.* 10(2).
http://emergence.org/ECO_site/web-content/ECO_10_2.html.

Primary Research Articles (since 2000)

- Carey, Nicole E, Daniel S Calovi, Paul M Bardunias, **J Scott Turner**, Radhika Nagpal and Justin Werfel. 2020. Differential construction response to humidity by related species of mound-building termites. *Journal of Experimental Biology* 222(20): 10.1242/jeb.212274.
- Paul Bardunias, Daniel Calovi, Nicole Erin Carey, Rupert Soar, **Scott Turner**, Radhika Nagpal. 2020. The extension of internal humidity levels beyond the soil surface facilitates mound expansion in *Macrotermes*. *Proceedings of the Royal Society B. Biological Sciences* 287 (1930) 20200894, DOI: [10.1098/rspb.2020.0894](https://doi.org/10.1098/rspb.2020.0894)
- Narraway, C. L., O. S. Davis, , Oliver SP Davis, Sally Lowell, Katrina A Lythgoe, **J Scott Turner**, Stephen Marshall. 2019. Biotic analogies for self-organising cities. *Environment and Planning B: Urban Analytics and City Science*:
<https://doi.org/10.117723998083198827302399808319882730>.
- Calovi, Daniel S, Paul Bardunias, Nicole Erin Carey, **J Scott Turner**, Radhika Nagpal, Justin Werfel. 2019. Surface curvature guides early construction activity in mound-building termites. *Philosophical Transaction of the Royal Society B:* 374 (20180374). <http://dx.doi.org/10.1098/rstb.2018.0374>.
- Sayama, Hiroki, Farnaz Zamani Esfahlani, Ali Jazayeri, **Scott Turner.** 2017. Robust tracking and behavioral modeling of movements of biological collectives from ordinary video recordings. arXiv: 1707.07310v1.
- Ocko, Samuel A, Hunter King, David Andreen, Rupert Soar, **J Scott Turner**, L Mahadevan. 2017. Solar-powered ventilation of African termite mounds. *Journal of*

Experimental Biology. 220 (18): 3260-3269.

DOI: 10.1242/jeb.160895

Petersen, K, Paul Bardunias, Nils Napp, Justin Werfel, Radhika Nagpal, and **Scott Turner**. 2015. Arrestant property of recently manipulated soil on *Macrotermes michaelseni* as determined through visual tracking and automatic labeling of individual termite behaviors. *Behavioral Processes*. 116:8-11.

DOI: 10.1016/j.beproc.2015.04.004

Green, Ben, Paul Bardunias, **Scott Turner**, Radhika Nagpal and Justin Werfel. (in press). Excavation and aggregation as organizing factors in de novo construction by mound-building termites. *Proceedings of the Royal Society B: Biological Sciences* **284** (1856): 20162730. DOI: 10.1098/rspb.2016.2730

Adams, A. M., E. Marais, **Turner, J. Scott**, Prendini, Lorenzo, Pinshow, Berry. Similar burrow architecture of three arid-zone scorpion species implies similar ecological function. *The Science of Nature* **103**(7): 56-67.

Brickner-Braun, I, D Zucker-Milwenger, A Braun, **J S Turner**, B Pinshow and P Berliner. 2014. Ventilation of multi-entranced rodent burrows by boundary layer eddies. *Journal of Experimental Biology* **217**: 4141-4148. doi:10.1242/jeb.114231.

J S Turner. 2001. On the mound of *Macrotermes michaelseni* as an organ of respiratory gas exchange. *Physiological and Biochemical Zoology* 74(6): 798-822.

J S Turner. 2000. Architecture and morphogenesis in the mound of *Macrotermes michaelseni* (Sjöstedt) (Isoptera: Termitidae, Macrotermitinae) in northern Namibia. *Cimbebasia* 16: 143-175.