Curriculum vitae - Chad M. Eliason

Education

The University of Akron 2014
Ph.D. Integrated Bioscience

The University of Akron 2006
M.S. Education

Baldwin-Wallace University 2002
B.S. Biology

Appointments

Field Museum of Natural History

Senior Research Scientist, Grainger Bioinformatics Center	2023-
Research Scientist, Grainger Bioinformatics Center	2021-2023
Postdoctoral Scholar, Grainger Bioinformatics Center	2019-2021
Postdoctoral Scholar, Integrative Research Center	2017-2019

The University of Texas at Austin

Postdoctoral Scholar, Jackson School of Geosciences 2014-2016
Advisor: Julia A. Clarke

Grants and fellowships

2021-2025 NSF DEB "Collaborative Research: Genomics of speciation and evolution of ecological traits in a geographic radiation of island kingfishers" (co-PIs Michael Andersen, Shannon Hackett, Corinne Myers; total $1,412,678, Eliason lab budget $421,064)

2021 Science Innovation Award, Field Museum of Natural History "Comparative chromosome evolution in birds" (co-PIs Taylor Hains, Shannon Hackett, John Bates, Joao Capurucho; $55,000)

2021 Grainger Bioinformatics Center Grant, Field Museum of Natural History, 2021 ($77,000)

2019-2020 Grainger Bioinformatics Center Grant, Field Museum of Natural History ($98,000)

2016-2018 Bass Postdoctoral Fellowship, Field Museum of Natural History ($95,000)

2015-2016 NSF REU Supplement "Collaborative Research: Phylogenomics of palaeognathous birds and the genomic basis of flightlessness" ($6771)

2011 The University of Akron, Tiered Mentoring Research Program ($1000)

Manuscripts

(1784 citations, h-index=19, *: undergraduate co-author)

Submitted

39 McCullough JM, Eliason CM, Hackett SJ, Myers C, Andersen MJ. Phylogenomics of a genus of 'Great Speciators' reveals rampant incomplete lineage sorting, gene flow, and mitochondrial capture in island systems. In review at **Systematic Biology**.

38 Eliason CM, Riede T, Laverde-R O, Goller F, Clarke JA. Acoustic allometry in birds informs the estimation of extinct dinosaur vocalizations. In review at **Nature Communications**.

37 Eliason CM, Marcondes RS, Eaton MD, Maia R, Burns KJ, Shultz AJ. Constraint and innovation in color evolution among species and among plumage patches in five avian radiations. In revisions **Evolution Letters**.

Published or in press

36 Eliason CM, Nicoläi M, Bom C, D'Alba LD, Shawkey MD. 2024. Transitions between colour mechanisms affect speciation dynamics and range distributions of birds. **Nature Ecology & Evolution**.

35 Legendre LJ, Rodriguez-Saltos CA, Eliason CM, Clarke JA. 2023. Evolution of the syrinx of Apodiformes including the vocal-learning Trochilidae (Aves: Strisores). **Zoological Journal of the Linnean Society**.

34 Longtine C, Eliason CM, Lee C, Mishkind D, Chiappone M, Goller F, Love J, Kingsley EP, Clarke JA, Tabin CF. 2023. Homology and the evolution of vocal folds in the novel avian voice box. In press at **Current Biology**.

33 Eliason CM, Mellenthin LE, Hains T, McCullough JM, Pirro S, Andersen SJ, Hackett SJ. 2023. Genomic signatures of convergent shifts to plunge-diving behavior in birds. **Communications Biology** 6(2011).

32 Eliason CM, McCullough JM, Hackett SJ, Andersen MJ. 2023. Complex plumages spur rapid color diversification in island kingfishers (Aves: Alcedinidae). **eLife**.

31 Eliason CM, Cooper JC, Hackett SJ, Zahnle E, Pequeño Sacoe TZ, Hauber ME, Bates JM. 2023. Transgressive hybridization can accelerate the evolution of gorget color divergence in Heliodoxa hummingbirds (Aves: Trochilidae). **Journal of the Royal Society Open Science**.

30 Eliason CM, Proffitt JV, Clarke JA. 2023. Early diversification of avian limb morphology and the role of modularity in the locomotor evolution of crown birds. **Evolution** 77(2): 342-354.

29 Eliason CM, Clarke JA, Kane SA. 2022. Wrinkle nanostructures generate diffractive blue color in great argus (*Argusianus argus*) flight feathers. **iScience**.

28 Eliason CM, Hains T, McCullough JM, Andersen MJ, Hackett SJ. 2022. Novelty of sensory genes within a 'great speciator' revealed with a high-quality reference genome of the collared kingfisher (*Todiramphus chloris collaris*). **G3: Genes, Genomes, Genetics**.

27 Norden KK, Eliason CM, Stoddard MC. 2021. Evolution of brilliant iridescent feather nanostructures. **eLife**.

26 Eliason CM, McCullough J, Andersen MJ & Hackett SJ. 2021. Accelerated brain shape evolution is associated with rapid diversification in an avian radiation. **The American Naturalist** 197(5).

25 Eliason CM, Straker L, Jung S & Hackett SJ. 2020. Morphological innovation and biomechanical diversity in plunge-diving birds. **Evolution** 74(7): 1514-1524.

24 Eliason CM & Clarke JA. 2020. Cassowary gloss and a novel form of structural color in birds. **Science Advances** 6(2): eeba0187.

23 Eliason CM, Maia R, Parra J & Shawkey MJ. 2020. Signal evolution and morphological complexity in hummingbirds (Aves: Trochilidae). **Evolution** 74(2) 447-458. ***(Highlighted***

in The National Audubon Society)

22 Eliason CM, Edwards SJ & Clarke JA. 2019. phenotools: an R package for visualizing and analyzing phenomic datasets. **Methods in Ecology & Evolution** 10(9): 1393-1400.

21 Eliason CM, Andersen MJ & Hackett SJ. 2019. Using historical biogeography models to understand color pattern evolution. **Systematic Biology** 68(5): 755-766.

20 Eliason CM. 2018. How do complex signals evolve? **PLOS Biology** 16(12): e3000093.

19 Eliason CM & Clarke JA. 2018. Metabolic physiology explains macroevolutionary trends in the melanic color system across amniotes. **Proceedings B** 285: 20182014.

18 Kingsley EP, Eliason CM† (contributed equally), Riede T, Li Z, Hiscock TW, Farnsworth M, Thomson SL, Goller F, Tabin CJ & Clarke JA†. 2018. Identity and novelty in the avian syrinx. **PNAS** 115(41): 10209-10217.

17 Li Z, Clarke JA, Eliason CM, Stidham TA, Deng T & Zhou Z. 2018. Vocal specialization through tracheal elongation in an extinct Miocene pheasant from China. **Scientific Reports** 8: 8099.

16 Hu D, Clarke JA, Eliason CM, Qiu R, Li Q, Shawkey MD, Zhao C, D'Alba L, Jiang J & Xu X. 2018. A bony-crested Jurassic dinosaur with iridescent plumage highlights complexity in early paravian evolution. **Nature Communications** 9(1): 217. ***(Received extensive media coverage, including Reuters, Discover Magazine, and National Geographic)***

15 Eliason CM, Hudson L*, Watts T*, Garza H* & Clarke JA. Exceptional preservation and the fossil record of tetrapod integument. 2017. **Proceedings of the Royal Society B** 284: 20170556. ***(Highlighted in National Science Foundation's Science 360 News)***

14 D'Alba L, Torres R, Waterhouse G, Eliason CM, Hauber M & Shawkey MD. 2017. What does the eggshell cuticle do? A functional comparison of eggshell cuticles. **Physiological and Biochemical Zoology** 90: 588-599.

13 Riede T, Eliason CM, Miller EH, Goller F & Clarke JA. 2016. Coos, booms, and hoots: the evolution of closed-mouth vocal behavior in birds. **Evolution** 70: 1734-1746. ***(Received extensive media coverage, including The Tonight Night Show with Jimmy Fallon, Time Magazine, NPR Weekend Edition; highlighted in Discover Magazine as one of the top-100 science stories of the year)***

12 Iskandar J-P*, Eliason CM, Astrop T, Igic B, Maia R & Shawkey MD. 2016. Morphological basis of glossy red plumage colors. **Biological Journal of the Linnaean Society** 119: 477-487.

11 Eliason CM, Shawkey MD & Clarke JA. 2016. Evolutionary shifts in the melanin-based color system of birds. **Evolution** 70: 445-455.

10 Eliason CM, Maia R & Shawkey MD. 2015. Modular color evolution in ducks facilitated by a complex nanostructure. **Evolution** 69: 357-367.

9 Eliason CM & Shawkey MD. 2014. Antireflection-enhanced color by a natural graded refracting index (GRIN) structure. **Optics Express** 22: A642-A650. ***(Highlighted in Virtual Journal of Biomedical Optics)***

8 D'Alba LD, Jones DN, Eliason CM, Badawy HT & Shawkey MD. 2014. Antimicrobial properties of a nanostructured eggshell from a compost-nesting bird. **Journal of Experimental Biology** 217: 116-1121.

7 Eliason CM, Bitton, P-P & Shawkey MD. 2013. How hollow melanosomes affect iridescent colour production in birds. **Proceedings of the Royal Society B** 280:

20131505.

6 Maia R, Eliason CM, Bitton, P-P, Doucet SM & Shawkey MD. 2013. pavo: an R package for the analysis, visualization and organization of spectral data. **Methods in Ecology and Evolution** 4: 906-913.

5 Eliason CM & Shawkey MD. 2012. A photonic heterostructure produces diverse iridescent colours in duck wing patches. **Journal of the Royal Society Interface** 9(74): 2279-2289. ***(Received press coverage in Science and Spiegel Online)***

4 Eliason CM & Shawkey MD. 2011. Decreased hydrophobicity of iridescent feathers: a potential cost of shiny plumage. **Journal of Experimental Biology** 214: 2157-2163. ***(Named as Editor's Choice for that issue of JEB, and as one of the top eight articles of the year; received press coverage in Spiegel Online)***

3 Shawkey MD, D'Alba L, Wozny J*, Eliason CM, Koop JAH & Jia L. 2011. Structural color change following hydration and dehydration of iridescent mourning dove (Zenaida macroura) feathers. **Zoology (Jena)** 114: 59-68.

2 Eliason CM & Shawkey MD. 2010. Rapid, reversible response of iridescent feather color to ambient humidity. **Optics Express** 18: 21284-92.

1 Blackledge TA and Eliason CM. 2007. Functionally independent components of prey capture are architecturally constrained in spider orb webs. **Biology Letters** 3: 456-458.

Book chapters and other publications

2020 Clarke JA & Eliason CM. 2020. "Feathers, beaks, scales and claws" in How Birds Work. **Princeton University Press**.

2020 Eliason CM, Maia R, Parra JL, Shawkey MD. 2020. The Evolution and Complexity of Hummingbird Colors Signals likely depend on social, ecological, and structural factors. **Natural History** 128 (3): 9-11.

2018 Papendieck A, Cheah YH, Eliason CM, & Clarke JA 2018. Mapping Research and Writing Mentorship Assemblages in a Mixed Cohort Course-based Research Experience. In Kay, J. and Luckin, R. (Eds.) Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018, Volume 3. London, UK: **International Society of the Learning Sciences**.

Invited talks

2022 Using specimens and next-gen tools to study novelty in birds. Biology Symposium, **University of New Mexico**, Albuquerque NM, November 3.

2018 Splashing into water: cranial and biomechanical diversity in a cosmopolitan radiation of birds. Comparative Aspects of Avian Morphology Symposium, **International Ornithological Congress**, Vancouver BC, August 27.

2018 Morphological and functional diversification in the beaks and feathers of birds, Evolutionary Morphology Seminar, **University of Chicago**, March 1.

2017 Mechanisms and evolution of signal traits in birds, Price lab talk, **University of Chicago**, September 13.

2017 Feathers, fossils, and signal evolution in birds, Armour lecture, **Field Museum of Natural History**, April 26.

2015 Diversity of form and function in the avian integument, Department seminar series, **University of Texas Austin**, March 12.

2014 Form-function relationships in iridescent bird feathers: optical and evolutionary implications, Department seminar series, **Baldwin-Wallace University**, April 25.

2013 Linking form and function to elucidate the evolution of iridescent colors in birds, **American Ornithological Union Meeting**, Physiological and Functional Advances in Avian Coloration Symposium, Chicago IL, August 13-17.

Contributed presentations

2021 Eliason CM, Riede T, Laverde-R O, Goller F, Clarke JA. Shared acoustic allometry in the largest and smallest known birds. SICB. January 3-7.

2019 Eliason CM, Maia R, Shawkey MD, Parra J. Signal evolution and morphological complexity in hummingbirds. AOS. Anchorage, Alaska. June 24-28.

2019 Eliason CM, Maia R, Shawkey MD, Parra J. Signal evolution and morphological complexity in hummingbirds. Sensorium. Urbana, IL. August 26-27.

2018 Maia R, Eliason CM, Parra J, Shawkey MJ. Re-visiting the optical bases of hummingbird (Aves:Trochilidae) coloration. Living Light Conference, 2018.

2018 Papendieck A, Cheah YH, Eliason CM, Clarke JA. Mapping Research and Writing Mentorship Assemblages in a Mixed Cohort Course-based Research Experience. International Conference on Learning Sciences, June 23-30.

2018 Takano OM, Bates JM, Dumbacher JP, Marks BD, Moyle RG, Peterson AT, Wieczorek J, Winkler DW, James HJ, Steadman DW, Eliason CM, Stanley EL, Blackburn DC. Inside the Birds of the World: CT-scanning fluid-preserved bird collections via the oVert Thematic Collections Network. AOS April 9-14.*

2018 Eliason CM, Hackett SJ. Splashing into water: cranial and biomechanical diversity in a cosmopolitan radiation of birds. SICB annual meeting, January 3-7.

2017 Eliason CM, Andersen M, Hackett SJ. Can we use biogeography models to understand plumage evolution in birds? Society for the Study of Evolution annual conference, June 23-27.*

2017 Clarke, J., Eliason, C., & Papendieck, A. Curiosity to Question: Mixed cohorts and tiered mentorship to scale course-based research and writing experiences. Symposium on Changing Education: Redesigning the Undergraduate Experience, Austin, TX, March 30.

2016 Eliason CM, Hudson L, Watts T, Garza H, Clarke JA. Exceptional preservation and the fossil record of tetrapod integument. Geological Society of America annual meeting, September 25-28.

2016 Riede T, Eliason CM, Miller EH, Goller F, Clarke JA. Coos, booms, and hoots: the evolution of closed-mouth vocal behavior in birds. International Congress of Vertebrate Morphology annual conference. Washington D.C. June 29-July 3.

2016 Riede T, Eliason, CM, Miller EH, Goller F, Clarke JA. Coos, booms, and hoots: the evolution of closed-mouth vocal behavior in birds. Societ for the Study of Evolution annual conference. Austin, TX. June 17-21.

2016 Eliason CM, Clarke JA. Pipelines and methods for visualization and analysis of phenomic data. Society for the Study of Evolution annual conference. Austin, TX. June 17-21.*

2016 Eliason CM, Shawkey MD, Clarke JA. Evidence for early shifts in the melanin-based color system of birds. Society for Integrative and Comparative Biology annual conference. Portland, OR, USA. January 3-7.

2015 Eliason CM, Shawkey MD, Clarke JA. Melanosome shape and color diversity in palaeognathous birds. Evolution conference. Norman, OK. July 28-August 2.

2014 Eliason CM, Maia R, Shawkey MD. Modular color evolution facilitated by a complex nanostructure in birds. Society for the Study of Evolution annual conference, Rayleigh NC, June 20-24.

2013 Hsiung B-K, Eliason CM, Shawkey MD, Blackledge TA. Nanostructural basis for blue color in tarantulas. 19th International Congress of Arachnology. Taiwan. June 23-28.*

2013 Eliason CM, Maia R, Shawkey MD. Optics and evolution of iridescence in the wings of ducks. Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA. January 3-7.

2012 Eliason CM, Maia R, Shawkey MD. Evolvability of photonic heterostructures in dabbling ducks. Evolution annual meeting. Ottawa, Ontario. July 6-10.*

2011 Eliason CM, Maia R, Shawkey MD. Sexual selection and the evolution of colorful wing patches in ducks. Evolution annual meeting. Norman, OK. June 17-21.*

2011 Eliason CM, Shawkey MD. Rapid, reversible response of iridescent feather color to ambient humidity. Society for Integrative and Comparative Biology Annual Meeting, Salt Lake City, UT. January 3-7.

*: poster

Teaching and mentorship

Co-instructor

The University of Texas at Austin

Research design, quantitative analysis, and data visualization in integrative biology (Fall 2016): Developed R modules, co-taught course, oversaw student projects

The University of Akron

Programming and Applied Statistics using R (12h workshop, Fall 2013)

Teaching assistant

The University of Akron

Comparative Vertebrate Morphology (Fall 2012)
Microbiology (Spring 2005, Summer 2005, Fall 2010, Spring 2012)
Ornithology (Fall 2011)
Principle of Biology (Fall 2009, Spring 2010)
Genetics (Fall 2005)

Guest lecturer

The University of Texas at Austin

Language and Communication Across Species (1h class, Oct 31, 2016)

The University of Akron
Ornithology (3h class, Fall 2014)
Electromagnetism and Light (1h class, Fall 2012, 2013)

Research mentor

Field Museum of Natural History
Supervised 10-week long NSF REU research project (Summer 2018)
Supervised undergraduate research in geometric morphometrics (Summer 2017)

The University of Texas at Austin
Supervised 10+ diverse undergraduates in paleontological research (2014-2016)

The University of Akron
Supervised independent undergraduate thesis projects (2010, 2013)

Students supervised: Chance Mitan, Jean-Pierre Iskandar, Jessica Valdes (Denver Museum of Natural History), Hector Garza, Leslie Jordan, Paul Viola (UT Austin), Jenny Le, James Hall, Victor Gonzalez, Rebecca Van Houten, Mitchell Riegler (Virginia Tech MS candidate), Adele Anderson (Brown University graduate), Kris Menghi (Purdue), Lauren Mellenthin (Iowa State University), Winston Wilson (University of Chicago)

Service to profession

Associate editor

2022- Ornithology

Departmental and society service

2018 Judge for student Wake Awards, Society for Integrative and Comparative Biology Annual Meeting
2015 Session Chair, Society for the Study of Evolution Annual Meeting
2012 Interviewer for the Honors College scholarship program, The University of Akron
2011 Session Chair, Society for Integrative and Comparative Biology Annual Meeting

Reviewer

2010- PNAS, PLOS Biology, Scientific Reports, Systematic Biology, Evolution, The American Naturalist, Proceedings of the Royal Society B, PLOS One, Ecology and Evolution, PeerJ, Journal of Anatomy, Behavioral Ecology and Sociobiology, Journal of Applied Spectroscopy, Optics Express, African Journal of Ecology, Journal of Avian Biology, Journal of Experimental Zoology, Biology Open, Auk

Public engagement

Community outreach

2018 Admiral Lecture Series "How birds make colorful feathers, and why it matters", September 25

2017 Field Museum of Natural History, "Speed Science" event, December 11
2017 Park View Elementary School, Science Olympiad program, December 8 (3h)
2017 Evanston Bird Club "How birds make colorful feathers, and why it matters", September 26
2017 Field Museum of Natural History, "Speed Science" event, September 14
2017 Field Museum of Natural History, donor outreach event, September 7
2017 Field Museum of Natural History, Members' Night outreach event, May 18
2017 Field Museum of Natural History, High school "talk to a scientist" event, April 19

Blogging

2018 Facebook Livestream event on reconstruction of color in extinct dinosaurs, January 23
2017 Feather blog (https://www.fieldmuseum.org/science/blog/feathers-and-our-feathered-friends)
2017 Facebook post on brain shape in birds, July 18
2017 Facebook Livestream event on feather coloration, Feb 14

High school mentorship

2012 Volunteer judge, Buchtel High-School Science Fair, Akron, OH
2005 Volunteer judge, Science and Technology EXPO, Akron, OH
2005 Research mentor, K-12 "Science Buddies" Program, Akron, OH

References

Shannon J. Hackett
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Advanced Science Research Center
GC CUNY
85 St. Nicholas Terrace
New York, NY 10031, USA
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The University of Texas at Austin
2305 Speedway, Stop C1160
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