

Josef C Uyeda

Associate Professor

Department of Biological Sciences

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Education

2012. Ph.D. Zoology. Oregon State University, Corvallis, OR.

Dissertation Title: *Connecting microevolutionary processes with macroevolutionary patterns across space and time*. Advisor: Prof. Stevan J Arnold

2006. B.A. with honors, *summa cum laude*. Willamette University, Salem, OR.

Major: Biology, Minor: Chemistry

Thesis advisors: Susan Kephart & Robert Drewes (California Acad. Of Sci.)

Academic employment

2023-Present. Associate Professor, Department of Biological Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA

2017-2023. Assistant Professor, Department of Biological Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA

2012-2017. Postdoctoral Fellow, Institute for Bioinformatics and Evolutionary Studies (IBEST). University of Idaho, Moscow, ID. Supervisor: Prof. Luke J. Harmon

Publications

As of Jan 31, 2025 (Google Scholar): 3,366 citations (2,268 since 2020)

H-index = 21, i10-index = 29

Peer-Reviewed Journal Articles

^Ggraduate mentee | ^Uundergraduate | ^Ppostdoc mentee | ^{GC}graduate committee

*corresponding author | ^Ssenior author

37. Brooks, GC; **Uyeda, JC**; Bone, N^G; Conrad, HM; Mull, CG; Kindsvater, HK.
Fundamental constraints on vertebrate life history are shaped by aquatic-terrestrial transitions and reproductive mode. *Nature Ecology & Evolution*, *Accepted*.
36. Dalponti, G; Caliman, A; Uyeda, JC; Guariento, RD. 2024. Climate and ecosystem type affect the correlated evolution of body size and trophic position in fishes. *Global Ecology and Biogeography* 33(10):e13891. [Journal Impact Factor: 6.3].
35. Alencar, LRV; Schwery, O^P; Gade, MR; Dominguez-Guerrero, SF; Tarimo, E^G; Bodensteiner, BL^{GC}; **Uyeda, JC**; MM Muñoz. 2024. Opportunity begets opportunity to drive macroevolutionary dynamics of a diverse lizard radiation. *Evolution Letters*, 8(5):623-637. [Journal Impact Factor: 3.4]
34. Porto, DS^P; **Uyeda, JC**; Miko, I; Tarasov, S^P. 2024. ontophylo: Reconstructing the evolutionary dynamics of phenomes using new ontology-informed phylogenetic methods. *Methods in Ecology and Evolution*. 15(2):290-300. [Journal Impact Factor: 8.335]
33. Porto, DS^P; Tarasov, S^P; Charpentier, C^G; Lapp, H; Dahdul, W; Balhoff, J; Mabee, P; **Uyeda, JC**^S. 2023. rphenoscate: An R package for semantic-aware evolutionary analyses of anatomical traits. *Methods in Ecology and Evolution*. 14(10):2531-2540. doi:10.1111/2041-210X.14210. [Journal Impact Factor: 8.335]

32. Martinez-Gutierrez, CA^{GC}; **Uyeda, JC**, Aylward, FO. 2023. A timeline of bacterial and archaeal diversification in the ocean. *Elife*. 12:RP88268. doi:10.7554/eLife.88268.3 [Journal Impact Factor: 8.713]
31. Rolland, J; Henao-Diaz, FL; Doebeli, M; Germain, R; Harmon, LJ; Knowles, LL; Liow, LH; Mank, JE; Machac, A; Otto, SP; Pennell, M; Salamin, N; Silvestro, D; Sugawara, M; **Uyeda, JC**, Wagner, CE; Schluter D. Conceptual and empirical bridges between micro- and macroevolution. *Nature Ecology & Evolution* 7(8):1181-1193. doi: 10.1038/s41559-023-02116-7. [Journal Impact Factor: 19.1]
30. Machado FA^P; Mongle CS; Slater G; Penna A; Wisniewski A; Soffin A^U; Dutra V^U; **Uyeda JC^S**. 2023. Rules of teeth development align microevolution with macroevolution in extant and extinct primates. *Nature Ecology & Evolution* 7(10):1729-1739. doi: 10.1038/s41559-023-02167-w. [Journal Impact Factor:19.1]
29. Grabowski, M; Pienaar, J; Voje, KL; Andersson, S; Fuentes Gonzalez, J; Kopperud, BT; Moen, DS; Tsuboi, M; **Uyeda, JC**; and Hansen, TF. A cautionary note on “A cautionary note on the use of Ornstein Uhlenbeck models in macroevolutionary studies”. *Systematic Biology* 72(4):955-963. doi: 10.1093/sysbio/syad012. [Journal Impact Factor: 9.16]
28. Liow, LH; **Uyeda, JC**; and Hunt, G. 2022. Cross-disciplinary information for understanding macroevolution. *Trends in Ecology and Evolution*. DOI: 10.1016/j.tree.2022.10.013. [Journal Impact Factor: 17.71]
27. Mongle, CS; Nesbitt, A; Machado, FA^P; Smaers, JB; Turner, AH; Grine, FE; and **Uyeda, JC^S**. 2022. A common mechanism drives the alignment between the micro- and macroevolution of primate molars. *Evolution*, doi:10.1111/evo.14600. [Impact Factor: 4.17].
26. Porto, DS^P, Dahdul, W, Lapp, H, Balhoff, J, Vision, T, Mabee, P and **Uyeda, JC^S**. 2022 Assessing Bayesian phylogenetic information content of morphological data using knowledge from anatomy ontologies. *Systematic Biology*, syac022. doi:10.1093/sysbio/syac022. [Impact Factor: 15.68].
25. Harmon, LJ, Pennell, MW, Henao-Diaz, LF, Rolland, J, Sipley, B and **Uyeda, JC^S**. 2021. The causes and consequences of the ubiquitous time- scaling of all evolutionary rates. *Annual Review of Ecology, Evolution and Systematics* 52:587-1105. [Impact Factor: 13.92]
24. Wynd, BM^{GC}, **Uyeda, JC** and Nesbitt, S. 2021. Including distorted specimens in allometric studies: Linear mixed models account for deformation. *Integrative Organismal Biology* 3(1):obab017. doi:10.1093/iob/obab017. [Impact Factor: 3.33]
23. Roman-Palacios, C; Wright, A; and **Uyeda, JC^S**. 2021. treedata.table: A wrapper for data.table that enables fast manipulation of phylogenetic trees matched to data. *PEERJ* 9:e12450. doi: 10.7717/peerj.12450. [Impact Factor: 3.33]
22. Cloyed, CS, Grady, J, Savage, V, **Uyeda, JC** and Dell, AI. 2021. The allometry of animal locomotion. *Ecology* 102(7):e03369. doi: https://doi.org/10.1002/ecy.3369. [Impact Factor: 5.55]
21. **Uyeda, JC***, Bone, N^G, McHugh, SW^G, Rolland, J, and Pennell, MW. 2021. How should functional relationships between metabolic rate and body temperature be measured at macroevolutionary scales? *Evolution* 75(5):1097-1105. doi: 10.1111/evo.14213. [Impact Factor: 3.75]
20. Farallo, VR, Munoz, MM, **Uyeda, JC** and Miles, DB. 2020. Scaling between macro-to-microscale climatic data reveals strong phylogenetic inertia in niche evolution in plethodontid salamanders. *Evolution*, 74(5):979-991. doi: 10.1111/evo.13959. [Impact Factor: 3.75]

19. Tarasov, S^P, Miko, I, Yoder, MJ and **Uyeda, JC^S**. 2019. PARAMO: A pipeline for reconstructing ancestral anatomies using ontologies and stochastic mapping. *Insect Systematics and Diversity*, 3(6), doi:10.1093/isd/ixz009. [Impact Factor: 4.77]
18. **Uyeda, JC***, Zenil-Ferguson, R and Pennell, MW. 2018. Rethinking phylogenetic comparative methods. *Systematic Biology* 67(6):1091-1109. doi: 10.1093/sysbio/syy031. [Impact Factor: 2019-10.41 (8th most cited article) 2020-15.69 (9th most cited article)]
17. Zanne, AE, Pearse, WD, Cornwell, WK, McGlenn, DJ, Wright, IJ and **Uyeda, JC^S**. 2018. Functional biogeography of angiosperms: life at the extremes. *New Phytologist* (4):1697-1709. doi: <https://doi.org/10.1111/nph.15114>. [Impact Factor: 8.512]
16. Boucher, FC, Demery, V, Conti, E, Harmon, LJ and **Uyeda, JC^S**. 2018. A general model for estimating macroevolutionary landscapes. *Systematic Biology*, 67(2):304-319. doi: 10.1093/sysbio/syx075. [Impact Factor: 10.27]
15. Hagey, TJ, **Uyeda, JC**, Crandell, KE, Cheney, JA, Autumn, K and Harmon, LJ. 2017. Tempo and mode of performance evolution across multiple independent origins of adhesive toe pads in lizards. *Evolution*, 71(10):2344-2358. doi:10.1111/evo.13318. [Impact Factor: 3.57; **Evolution News Digest coverage: Tiatragul, S., Murali, G., and JT Stroud. doi:10.1111/evo.13338**]
14. **Uyeda, JC***, Pennell, MW, Miller, ET, Maia, R and McClain, CT. 2017. The evolution of energetic scaling across the vertebrate tree of life. *The American Naturalist*, 190 (2):185-199. doi: 10.1086/692326. [Impact Factor: 2018-3.86 (7th most cited article)]
13. **Uyeda, JC***, Harmon, LJ and Blank, CE. 2016. A comprehensive study of cyanobacterial morphological and ecological evolutionary dynamics through deep geologic time preserved in the genomes of modern taxa. *PLoS ONE* 11(9): e0162539. doi:10.1371/journal.pone.0162539. [Impact Factor: 2.77]
12. **Uyeda, JC**, Caetano, DS, and Pennell, MW. 2015. Statistical and conceptual challenges to the comparative analysis of principal components. *Systematic Biology*, 64 (4): 677-689. doi: 10.1093/sysbio/syv019. [Impact Factor: 8.92]
11. **Uyeda, JC***, and Harmon, LJ. 2014. A novel Bayesian method for inferring and interpreting the dynamics of adaptive landscapes from phylogenetic comparative data. *Systematic Biology*, 63(6):902-918. doi: 10.1093/sysbio/syu057. [Impact Factor: 8.23]
10. Pennell, MW, Eastman, JM, Slater, GJ, Brown, JW, **Uyeda, JC**, Fitzjohn, RG, Alfaro, ME and Harmon, LJ. 2014. geiger v2.0: an expanded suite of methods for fitting macroevolutionary models to phylogenetic trees. *Bioinformatics*, doi:10.1093/bioinformatics/btu181. [Impact Factor: 7.31]
9. Pennell, MW, Harmon, LJ and **Uyeda, JC^S**. 2014. Speciation is unlikely to drive divergence rates. *Trends in Ecology and Evolution*, 29(2):72-3. doi: 10.1016/j.tree.2013.12.010. [Impact Factor: 16.74]
8. Pennell, MW, Harmon, LJ and **Uyeda, JC^S**. 2013. Is there room for punctuated equilibrium in macroevolution? *Trends in Ecology and Evolution*, 29(1):23-32. doi: 10.1016/j.tree.2013.07.004. [Impact Factor: 16.20]
7. Jones, AG, Bürger, R, Arnold, SJ, Hohenlohe, PA and **Uyeda, JC**. 2012. The effects of stochastic and episodic movement of the optimum on the evolution of the G-matrix and the response of the mean to selection. *Journal of Evolutionary Biology*, 25(11):2210-2231. [Impact Factor: 3.48]
6. Eddy, SL, Kiemiec-Tyburczy, KM, **Uyeda, JC** and Houck, LD. 2012. The influence of sequential male courtship behaviors on courtship success and duration in a terrestrial salamander, *Plethodon shermani*. *Ethology*, 118(12):1240-1250. doi: 10.1111/eth.12031. [Impact Factor: 1.56]

5. **Uyeda, JC***, Hansen TF, Arnold SJ and Pienaar, J. 2011. The million-year wait for macroevolutionary bursts. *Proceedings of the National Academy of Sciences*, 108(38):15908-15913. doi: 10.1073/pnas.1014503108. [Impact Factor: 9.74]
4. Westphal, MF, Morey, SR, **Uyeda, JC**, and Morgan, TJ. 2011. Molecular phylogeny of the subfamily Amphistichinae (Teleostei: Embiotocidae) reveals a convergent loss of red pigmentation in two rapidly evolving lineages of sand-dwelling surfperch. *Journal of Fish Biology* 79:313-330. doi: 10.1111/j.1095-8649.2011.03011.x [Impact Factor: 1.83]
3. **Uyeda, JC***, Arnold, SJ, Hohenlohe, PA, and Mead, LS. 2009. Drift promotes speciation by sexual selection. *Evolution* 63(3):583-594. doi:10.1111/j.1558-5646.2008.00589.x. [Impact Factor: 5.66]
2. **Uyeda, JC***, Drewes, RC, and Zimkus, BM. 2007. The California Academy of Sciences Gulf of Guinea Expeditions (2001, 2006) VI. A new species of *Phrynobatrachus* from the Gulf of Guinea islands and a reanalysis of *Phrynobatrachus dispar* and *P. feae* (Anura: Phrynobatrachidae). *Proceedings of the California Academy of Sciences*, 58(18):367-385.
1. **Uyeda, JC***, and Kephart, SR. 2007. Detecting species boundaries and hybridization in *Camassia quamash* and *C. leichtlinii* (Agavaceae) using allozymes. *Systematic Botany*, 31(4):642-655.

Peer-reviewed Conference Papers

5. Manogaran, HB; Maruf, M; Daw, A; Mehrab, KS; Carpentier, CP^G; **Uyeda, JC**; Dahdul, W; Thompson, MJ; Campolongo, EG; Provost, KL; Mabee, P; Lapp, H; Karpatne, A. What do you see in common? Learning hierarchical prototypes over tree-of-life to discover evolutionary traits. ICLR 2025, *Accepted*.
4. Khurana, M; Daw, A; Maruf, M; **Uyeda, JC**; Dahdul, W; Charpentier, C^G; Bakis, Y; Bart, HL; Mabee, PM; Lapp, H; Balhoff, JP; Chao, WL; Stewart, C; Berger-Wolf, T; Karpatne, A. 2024. Hierarchical conditioning of diffusion models using tree-of-life for studying species evolution. ECCV 2024. [Acceptance Rate: 27.9%]
3. Maruf, M; Daw, A; Mehrab, KS; Manogaran, HB; Neog, A; Sawhney, M; Khurana, M; Balhoff, JP; Bakis, Y; Altintas, B; Thompson, MJ; Campolongo, EG; **Uyeda, JC**; Lapp, H; Bart, HL; Mabee, PM; Su, Y; Chao, WL; Stewart, C; Berger-Wolf, T; Dahdul, W; Karpatne, A. 2024. VLM4Bio: A benchmark dataset to evaluate pretrained vision-language models for trait discovery from biological images. *NeurIPS 2024*. [Acceptance rate: 25.3%]
2. Khurana, M; Daw, A; Maruf, M; **Uyeda, JC**; Dahdul, WM; Charpentier, CP^G; Bakis, Y; Bart, H; Mabee, PM; Lapp, H; Balhoff, JP; Karpatne, A. 2024. Conditioning diffusion models using the knowledge of phylogeny for understanding species evolution. *AAAI-24*.
1. Elhamod, M; Khurana, M; Manogaran, HB; **Uyeda, JC**; Balk, MA; Dahdul, W; Bakis, Y; Bart Jr, H; Mabee, PM; Lapp, H; Balhoff, JP; Carpentier, C^G; Carlyn, D; Chao, WL; Stewart, CV; Rubenstein, DI; Berger-Wolf, T; Karpatne, A. 2023. Discovering novel biological traits from images using phylogeny-guided neural networks. *Proceedings of the 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*. 3966-3978. doi:10.1145/3580305.3599808

Perspectives & Commentaries

- Uyeda, JC; McGlothlin, JW. 2024. The predictive power of genetic variation. *Science* 384(6696): 622-623.

Book Chapters

Mabee, PM, Dahdul, WM, Balhoff, JP, Lapp, H, Manda, P, **Uyeda, JC**, Vision, TJ and M Westerfield. 2018. Phenoscope: Semantic analysis of organismal traits and genes yields insights in evolutionary biology. In: *Application of Semantic Technologies in Biodiversity Science*, edited by A. Thessen. IOS Press, Berlin.

Uyeda, JC. 2016. Quantitative genetics of evolutionary divergence and diversification. In: *The Encyclopedia of Evolutionary Biology, 1st Edition*, edited by Richard Kliman. Academic Press.

Publications in Preprint or Revision

Tarasov, S^P and **Uyeda, JC^S**. The hidden model space of phylogenetic state-dependent diversification models (SSEs): Congruence, Challenges, and Opportunities. BioRxiv Preprint. *In review at PNAS*. doi:10.1101/2022.07.04.498736.

McHugh, SW^G; Espindola, A; White, E^U; and **Uyeda, JC^S**. Jointly modeling species niche and phylogenetic model in a Bayesian hierarchical framework. BioRxiv Preprint. doi:10.1101/2022.07.06.499056. *In revision at Systematic Biology*.

Uyeda, JC; Machado, FA^P; Howell, BK^G; Eddy, SL. Addressing essentialisms in evolution education by unifying systems thinking across scales. *In review at BioScience*.

Grants Awarded

Since 2017: 5 grants, PI(2), Co-PI (3), Senior Personnel (1)

Uyeda Lab portion: \$1,981,280; VT portion: \$3,035,702; Total Funding: \$18,012,699

Grants in progress

2021-2026. Senior Personnel. *HDR Institute: Imageomics: A new frontier of biological information powered by knowledge-guided machine learning*. National Science Foundation Harnessing the Data Revolution, Office of Advanced Cyberinfrastructure (NSF-OAC-2118240). Part of leadership team: Convergence Workgroup Leader for Trait-Based Biology (1 of 6 convergence leads). PI: Tanya Berger-Wolf (Ohio State U), Co-PIs: Henry Bart (Tulane), Hilmar Lapp (Duke), Charles Stewart (RPI), Anuj Karpatne (VT). Total funding: \$14,969,077; VT: \$1,340,635; Uyeda Lab: \$295,376.

2021-2024. Co-PI. Multifactorial drivers of evolution in co-diversifying lineages with specialized plant-pollinator interactions. NSF Systematics and Biodiversity Science, NSF-DEB-2050745. PI: Anahi Espindola (University of Maryland). Co-PIs Josef Uyeda (VT), David Tank (University of Wyoming). Total funding: \$983,127; VT/Uyeda lab: \$135,619.

2020-2025. PI. CAREER: Integrating causal evolutionary processes into phylogenetic comparative biology. NSF Systematics and Biodiversity Science (NSF-DEB-1942717). Sole PI: Josef Uyeda (VT). Total funding/VT/Uyeda lab: \$981,487.

Past External Funding

2020-2023. Co-PI. De-mystifying the Tangled Bank: A Unified Adaptive Landscape Theory For The Emergence And Maintenance Of Life. Templeton Foundation, Natural Sciences (61866). Co-PIs: Martha Munoz (Yale University), Josef Uyeda (VT). Total Funding: \$799,641, VT/Uyeda lab: \$324,634.

2017-2022. PI. Collaborative Research: Enabling machine actionable semantics for comparative analyses of trait evolution. NSF Advancing Biological Infrastructure, NSF-DEB-1661516. PI: Josef Uyeda (VT); Collaborating PIs: Hilmar Lapp (Duke), Todd Vision (University of North Carolina-Chapel Hill), Paula Mabee (University of South Dakota/Batelle), Wasila Dahdul (University of South Dakota). Total funding/VT/Uyeda lab: \$172,356 + \$105,731 subcontract from Duke U. = \$278,087.

2010-2013. Co-PI. Doctoral Dissertation Improvement Grant. DISSERTATION RESEARCH: Determining the effect of hybridization on the evolvability of phenotypic traits using genomic

markers. National Science Foundation (NSF-DEB-1011352). PI: Stevan J. Arnold (Oregon State University), Co-PI: Josef Uyeda (OSU). Total Funding: \$14,961.

2011. Darwin's Legacy Workshop. Outreach Grant, Society for the Study of Evolution. Co-PI: Sarah Eddy, Josef Uyeda (Oregon State University). Total Funding: \$800.

2009. Nordic research supplement. NSF/ Research Council of Norway (Project No. 194945/V11). Co-Sponsors Thomas .F. Hansen, Tore Schweder (University of Oslo). Total Funding: \$20,000.

2007-2010. NSF Predoctoral Fellowship, National Science Foundation. Total Funding: \$130,500.

Past Internal Funding

2011. *Darwin's Legacy Workshop*. Outreach Grant, Precollege Programs, Oregon State University. Co-PIs: Sarah Eddy, Josef Uyeda (Oregon State University). \$800.

2010. *Darwin's Legacy Workshop*. Outreach Grant, Precollege Programs, Oregon State University. Co-PIs: Sarah Eddy, Josef Uyeda (Oregon State University). \$1000.

2009. Zoology Research Fund, Oregon State University. \$500

Science Communication

Invited Seminars

Mar 2024. *Uncovering the macroevolutionary architecture of trait divergence*. University of Michigan. EEB seminar series. Ann Arbor, MI.

Oct 2023. *Paleontological views of micro- and macroevolution: Are we using all our evidence to test hypotheses about the causes of macroevolutionary diversification?* IOS Network for the Integration of Speciation Research. Virtual webinar.
<https://www.youtube.com/watch?v=Uwz8OPxT7h0>

April 2023. *Reconstructing ancestral anatomies on phylogenies by linking traits with ontologies*. Symposium, Entomological Society of America Eastern Branch 2023 Meeting. Providence, Rhode Island.

April 2022 . *The macroevolutionary architecture of trait divergence*. University of Toronto, EEB Seminar Series. Toronto, Ontario, CAN. **Graduate student invited speaker.**

May 2021 . *Making sense of macroevolution: State, rate, and biological process knowledge*. University of Chicago, EVMORPH Seminar Series. Chicago, IL.

Mar 2021 . *Making sense of macroevolution: From single stories to many*. University of Georgia, Odum School of Ecology, Athens, GA. **Graduate Student Invited Speaker.**

Oct 2020 . *The measurement of macroevolutionary causes*. University of Calgary, Biology Department Seminar, Calgary, Alberta, Canada.

Oct 2020 . *The measurement of macroevolutionary causes*. University of Hawaii-Manoa, Biology Department Seminar, Manoa, HI.

Oct 2020 . *The measurement of macroevolutionary causes*. Virginia State University, Biology Department Seminar, Petersburg, VA.

April 2020. *The measurement of macroevolutionary causes*. Center for Ecological and Evolutionary Synthesis Seminar Series, University of Oslo, Oslo, Norway. Canceled due to COVID-19.

March 2020. *The measurement of macroevolutionary causes*. University of Virginia, Biology Department EEBIO Seminar, Charlottesville, VA. Canceled due to COVID-19.

March 2020. *The measurement of macroevolutionary causes*. Behavior, Ecology, Evolution and Systematics Seminar, University of Maryland, College Park, MD.

Feb 2020. *The measurement of macroevolutionary causes*. Duke Population Biology Seminar, Durham, NC.

Oct 2019 . *The measurement of macroevolutionary causes. Emerging Leader Talk (1 of 2 plenary speakers).* Southeastern Population Ecology and Evolutionary Genetics Conference, Clemson, SC.

Oct 2019 . *The measurement of macroevolutionary causes. American Museum of Natural History,* New York, NY .

July 2019 . *Beyond tempo and mode: Toward process-based models of macroevolutionary trait evolution.* SteveFest, Oregon State University, Corvallis, OR.

June 2019 . *Extracting meaning from phylogenetic comparative methods: The necessity of considering process.* Evolution 2019, Providence, RI.

Mar 2019. *Is speciation a cause of macroevolutionary change?* Gordon Speciation Conference, Ventura, CA.

Oct 2018 . *Macroevolutionary landscapes and phylogenetic natural history,* Department of Biology, George Washington University .

Aug 2018. *On the need for phylogenetic natural history,* Evolution 2018, Montpellier, France (invited poster).

June 2018. *On the need for phylogenetic natural history,* Mountain Lake Biological Station .

Mar 2018. *On the need for phylogenetic natural history,* Math Bio Seminar Series, Department of Mathematics, Virginia Tech.

Feb 2018. *On the need for phylogenetic natural history,* Department of Ecology and Evolution, Stony Brook University .

Feb 2018. *On the need for phylogenetic natural history,* Phyloseminar . Link: https://youtu.be/uzHz5jk_L7w

Nov 2017. *The Macroevolutionary Dynamics of Adaptive Landscapes,* Biology Department, UNC- Chapel Hill.

Nov 2017. *The Macroevolutionary Dynamics of Adaptive Landscapes,* Department of Biology, Duke University.

Oct 2017 . *On the need for phylogenetic natural history,* GBCB Seminar Series, Virginia Tech.

Oct 2017 . *The macroevolutionary dynamics of adaptive landscapes,* OWLS (Emeritus Professor Group), Blacksburg, VA.

June 2017. *Can ontologies help us understand trait evolution? (and vice versa?).* Society for Systematic Biology *Trees, traits and functions: Semantics for Comparative Biology Workshop,* Evolution 2017, Portland, OR.

June 2016. *Analyzing 'phenomic' data on phylogenies.* Next Generation Phenomics, Tools for the Tree of Life. Portland, ME.

Mar 2012. *The Evolutionary Blunderbuss: Connecting micro and macroevolution.* Willamette University, Salem, OR.

Contributed Talks and Posters at Professional Conferences

Oct 2023. *Trait-based evolutionary inferences guided by computable anatomy ontologies and phylogenies.* (contributed poster). 2023 NSF HDR Ecosystem Conference. Denver, CO.

June 2022. *Macroevolutionary modeling of life history evolution in vertebrates.* (contributed talk). Evolution 2022, Cleveland, OH.

June 2017. *Tracking continuously-varying adaptive landscapes through macroevolutionary time.* (contributed talk). Evolution 2017, Portland, OR.

June 2016. *Using synthetic databases to construct time-calibrated phylogenies for comparative analyses.* (contributed talk). Evolution 2016, Austin, Texas.

June 2015. *The evolution of energetic scaling relationships across the vertebrate tree of life.* (contributed talk). Evolution 2015, Guarujá, Brazil.

Nov 2014. *A novel Bayesian method for identifying adaptive shifts on phylogenies.* (contributed talk). Modern Phylogenetic Comparative Methods, Seville, Spain.

June 2014. *Detecting billion year old rate shifts in microbial evolution.* (contributed talk, co-authors Carrine Blank, Lisa Moore and Luke Harmon). Evolution 2014, Raleigh, NC.

Apr 2014. *Bayesian modeling of adaptive evolution on phylogenies.* (contributed talk)

July 2013. Evolution 2013, Snowbird, UT. *Better interpretation of patterns of trait evolution using a novel reversible-jump method of detecting adaptive regimes from phylogenetic comparative data.* (contributed talk). EVO-WIBO, Port Townsend, WA.

July 2012. *A classic example of stasis? Macroevolutionary patterns of body temperature evolution in mammals.* (poster, co-authors TF Hansen, G. Bloom and J Pienaar). Evolution 2012, Ottawa, ON.

July 2011. *How can evolutionary process models simultaneously explain micro- and macroevolutionary patterns? And how to study big evolutionary divergence databases* (contributed talk, co-authors TF Hansen, SJ Arnold and J Pienaar). Evolution 2011, Norman, OK.

July 2010. Evolution 2010, Portland, OR. (contributed talk, co-authors TF Hansen, SJ Arnold and J Pienaar).

Apr 2010. EVO-WIBO, Port Townsend, WA. (Poster- **Top Poster Award**)

Sept 2009. CEES annual conference, Holmen Fjordhotell, Norway. (contributed talk)

July 2009. Joint Meetings of Ichthyology and Herpetology, Portland, OR. (Poster)

June 2009. Evolution 2009, Moscow, ID. (Poster)

June 2008. *Speciation by drift in female mating preferences.* (contributed talk, co-authors SJ Arnold, PA Hohenlohe and LS Mead). Evolution 2008, Minneapolis, MN.

Apr 2008. *Speciation by drift in female mating preferences.* EVO-WIBO, Port Townsend, WA. (contributed talk, co-authors SJ Arnold, PA Hohenlohe and LS Mead)

Software

Rphenoscate Rphenoscate: Semantics for comparative analyses of trait evolution. (Maintainer & co-author, with Diego Porto, Sergei Tarasov, Hilmar Lapp, and Caleb Charpentier). <https://github.com/uyedaj/rphenoscate>.

BePhyNE Bayesian estimation of Phylogenetic Niche Evolution (contributor with author Sean McHugh, R package). <https://github.com/sean-mchugh/BePhyNE>

Ontobayes Ontology-aware Bayesian Phylogenetic Information Analysis of Morphological data. (contributor with author Diego Sasso Porto). <https://github.com/diegosasso/ontobayes>.

scate-shortcourse Phylogenetic Comparative Analysis of Integrated Anatomical Traits: A Short Course (co-author, R package). <https://github.com/phenoscape/scate-shortcourse>

PARAMO Phylogenetic Ancestral Reconstruction of Anatomy by Mapping Ontologies (co-author). <https://github.com/sergeitarasov/PARAMO>

bayou Bayesian fitting of Ornstein-Uhlenbeck models to phylogenies (author, R package), <http://cran.r-project.org/package=bayou>

treeplyr 'dplyr' functionality for matched tree and data objects (author, R package), <http://cran.r-project.org/package=treeplyr>

treedata.table Roman-Palacios, C; Wright, April; and Josef C Uyeda. 2021. treedata.table v0.1.1 - A Wrapper For data.table For Fast Manipulation Of Phylogenetic Trees Matched To Data (R package). ROpenSci. <https://github.com/ropensci/treedata.table>

geiger v2.0 Investigating evolutionary radiations (contributor, R package),
<http://cran.r-project.org/package=geiger>

Arbor Workflow software for comparative methods (contributor),
www.arborworkflows.com

Working groups

Oct 2019 MicMac Working Group, U of British Columbia, Vancouver, BC, CAN

Mar 2019 Long-term Trends in Evolution (Templeton Foundation), Biosphere 2, Tucson, AZ

Dec 2017 Computable Evolutionary Phenotype Knowledge Workshop, Duke U, Durham, NC

Feb 2016 Phenotypic Research Coordination Network, Biosphere 2, Tucson, AZ

Aug 2015 Evolution of lifespan, Tri-CEM working group, Duke U, Durham, NC

May 2015 Tempo and Mode of Plant Trait Evolution, NESCENT, Durham, NC

Sept 2014 OpenTree Hackathon Tree-For-All, AVATOL working group, Ann Arbor, MI

Awards and Recognition

2023 Principles of Community Award, Department of Biological Sciences, Virginia Tech.

2022 Outstanding Research Award, Department of Biological Sciences, Virginia Tech.

2021 Outstanding Teaching Award, Department of Biological Sciences, Virginia Tech.

2019 Southeastern Population Ecology and Evolutionary Genetics Conference Emerging Leader.

2017 Faculty1000Prime Article Recommendation: Uyeda et al. 2017. 3* Exceptional.

2005 Young Botanist Award, Society for Systematic Botany.

Mentorship

Current Postdoctoral researchers

T. Mason Linscott, Postdoctoral Fellow. NSF Postdoctoral Fellowship. 5/22-Present.

Laura Rodrigues Vieira de Alencar. Postdoctoral Fellow at Yale University EEB Department, (Co-advised by M Munoz and JC Uyeda).

Orlando Schwery. Postdoctoral Fellow. Swiss Mobility Fellowship. 8/1/2022-Present.

Brian Waldron, Postdoctoral Fellow. 8/10/2023-Present.

Former Postdoctoral researchers

Katherine Corn, Postdoctoral Fellow. 9/1/2022-7/31/2024. (Assistant Professor & Director of the Conner Museum of Vertebrates, Washington State University)

Fabio Andrade Machado, Research Scientist/Postdoctoral Fellow. 12/20-1/2023. (Assistant Professor, Oklahoma State University).

Diego Sasso Porto. Postdoc: 1/2020-1/2022. Academy Research Fellow, Natural History Museum of Finland, Helsinki, Finland.

Sergei Tarasov. Postdoc: 8/2018-5/2019. Current position: Curator at Natural History Museum of Finland, Helsinki, Finland.

Suman Neupane. Postdoc: 6/2018 - 7/2020. Current position: Assistant Professor, Ball State University, Muncie, IN.

Current Graduate Students

Nicholas Jordan Bone. PhD Candidate, began 2019. NSF Graduate Research Fellow. VT COS Dean's Diversity Fellowship.

Bailey Keith Howell. PhD student, began 2020. AAUW Fellow. Interfaces of Global Change Graduate Research Fellow.

Elizabeth Daniel Tarimo. PhD Student, began 2021. AAUW International Fellow. VT Sendelbeck Fellowship.

Caleb Charpentier. PhD Student, began 2022. NSF Graduate Research Fellow.

Completed Graduate Students

Sean W McHugh. MS. 8/2019-8/2021. *Phylogenetic Niche Modeling*. Current position: PhD student at Washington University in St. Louis.

Current Undergraduates Researchers

Kamal Dandekar. VT. Biological Sciences. Fall 2024-Present.

Abhishek Hari. VT. Computer Science. Spring 2025-Present

Britney Pereda-Ramos. VT. Biochemistry. Spring 2025-Present.

Former Undergraduate Researchers

Lia Fontanella. (Virginia Tech). Spring 2022-Spring 2024.

Samantha Pham (Virginia Tech). Fall, 2021 - Spring 2023.

Colin Greear (Virginia Tech). Fall 2021-Spring 2023.

Emma White (Virginia Tech) Summer 2020-Summer 2021. *Now MS Student at George Mason University*.

Vitor Dutra (Florida International University) Spring 2021-Fall 2021. *Now MS student at Florida International University*.

Kaine Lovill (Virginia Tech) Fall 2020-2022

Anna Soffin (Virginia Tech), Summer 2020-2022

Heather Connor (Virginia Tech), Spring 2019

Brian Yoon (Virginia Tech), Fall 2018-Spring 2019.

Sheng Kao (Oberlin College), Summer 2018 & 2019

Former Visiting Research Scholars

Guilherme Dalponti, PhD candidate at Federal University of Mato Grosso do Sul, Brazil, Spring 2020-July 2020; completed PhD in 2021.

Graduate Committees

VT Department of Biological Sciences (13 students); VT Department of Geosciences (7 students); University of Maryland Department of Entomology (1 student); Yale University, Department of Ecology and Evolutionary Biology (2 students).

Total: 23 (13 completed; 5 dissertation chapters co-authored with candidate).

Teaching Experience

Instructor of record

2024 Instructor. Freshman Seminar: Genetic Stories and Ancestry (BIOL2984). 1 Credit. Virginia Tech.

2024 Instructor. Topics in Vertebrate Biology (BIOL5984): Sex, Gender, and Essentialist Thinking in Biology. 1 Credit. Virginia Tech.

2018-Present Instructor. Evolutionary Biology (BIOL2704). 3 Credits. Virginia Tech. *Teach every spring semester with 120-150 students per class (Total: 580 students). Virtual in 2021 and 2020. Have mentored 2 graduate TAs and 5 undergraduate teaching assistants.*

2022-2023 Instructor. Special Study: Quantitative Evolutionary Biology (BIOL2984). 1 Credit. Co-taught with Jeremy Draghi. Virginia Tech. *I developed this new 1 credit course taught concurrently with our Evolutionary Biology courses with J. Draghi that gives early biology students a tour of applications of math, statistics, and computer programming to evolutionary problems (Total: 8 students).*

Fall 2018-Present Instructor. SS/TS: Macroevolution & Phylogenetics (BIOL 5984, BIOL 6014). 3 Credits. Virginia Tech. *Developed and teach this graduate course with ~10-15 students per class (Total from 3 classes = 35 students). Previously taught as a Special Study course, will develop into a full course.*

Fall 2011 Instructor. Evolution (BIOL445/545), Oregon State University. *Taught ~70 undergraduate and 8 graduate students.*

Summers 2011, 2012 Instructor, Principles of Biology (BIOL211), Oregon State University. *Summer session instructor of record for ~100 students per class.*

Co-taught courses

Fall 2024 BIOL-5005 Intro to grad studies course (Instructor of Record, Daniela Cimini). Led 5 sessions on Diversity training for graduate students.

Fall 2024-Winter 2025 STAT-5984: Experiential Introduction to Artificial Intelligence and Ecology. Led a week long module on evolutionary biology as it pertains to the courses experiential field course. Students develop projects to conduct that combine AI and field biology which they execute in the Winter field excursion at the NEON site on the big island of Hawaii.

Fall 2022 - Winter 2023 Co-instructor (Instructor of Record Leanna House, Stats). SS: Experiential Introduction to Imageomics (STAT 5984). 1 Credit. Co-taught with Leanna House (VT), Anuj Karpatne (VT), Dan Rubenstein (Princeton), Hank Bart Jr (Tulane), Tanya Berger-Wolf (Ohio State U.), Yu Su (Ohio State U.), Chuck Stewart (RPI), Wei-Lun Chao (Ohio State U.) and the Imageomics team. This multi-institution course is run virtually over Zoom and pairs computer science students with trait biologists and culminates in a project-based experience in Mpala research station in Kenya. I am on the leadership team for this project that developed the course and co-teach several of the lectures with team members. (22 students, 4 from Virginia Tech).

Workshops & Invited Teaching Lectures

2023 Instructor, Society of Systematic Biologists Chamela Phylogenetics Methods Field Course. Chamela Biological Station, Jalisco, Mexico.

2023 Instructor, Imageomics Field Course. Mpala Research Centre. Nanyuki, Laikipia, Kenya.

2011-2022 Instructor, Evolutionary Quantitative Genetics Workshop, NESCENT, NIMBioS & Friday Harbor Labs (Workshop with SJ Arnold & J Felsenstein). *Invited instructor for yearly workshop lead by SJ. Arnold and J. Felsenstein. ~30 students per week-long workshop. Canceled in 2020, virtual in 2021 and 2022.*

2022 Instructor, Imageomics All-Hands meeting. Ohio State University, Columbus, OH. *Co-taught with Anuj Karpatne (VT) computer scientists and biologists the fundamentals of trait evolutionary modeling (~25 attendees).*

2018-Present Guest lecturer (yearly), Working with Ecological and Evolutionary Data (BIOL5984). Instructor Dr. Kate Langwig, Virginia Tech.

2021 Guest lecturer, The Science of COVID. Instructors Dr. I. Moore & Dr. J. Draghi. ~80 students.

2020 Phylogenetic comparative analysis of integrated anatomical traits, SSB Workshop. SSB 2020, Gainesville, FL. *Co-organized and taught half-day workshop, 55 attendees.*

2019 Nantucket DevelopE Workshop, UMASS Nantucket Field Station, Nantucket, MA. *One of 4 instructors at this week-long workshop, 12 attendees.*

2019 Semantic Comparative Analysis of Trait Evolution Workshop, Providence, RI. *Co-organized and taught half-day workshop, 13 attendees.*

2017 Workshop leader, *bayou* tutorial, SSB standalone meeting, Baton Rouge, LA. *Sole organizer and instructor, ~20 attendees.*

2016 Invited Instructor, Next Generation Phenomics Tools, Portland, Maine.

2016 Invited Guest Lecturer, Biology 102: Biology & Society, University of Idaho.

2013-2016 Invited Guest Lecturer, Biology 489: Herpetology, University of Idaho.

2015 Society of Systematic Biology Model Based Molecular Systematics Workshop Instructor, Guarujá, Brazil.

2012 Invited Guest Lecturer, Biology 445: Evolution, Oregon State University.

2009 Invited Guest Lecturer, Biology 370: Ecology, Oregon State University.

Teaching Assistantships

2010-2011 Teaching Assistant, Biology 211, 212 & 213, Oregon State University

2006-2007 Teaching Assistant, Biology 211, 212 & 213, Oregon State University

2006 Teaching Assistant, Biology 352: Plant Sys & Evol, Willamette University

2005 Teaching Assistant, Biology 355: Vertebrate Zoology, Willamette University

2004-2005 Teaching Assistant, Biology 125: Ecology, Evol & Diversity, Willamette University

Professional Development Training

2022, Inclusive VT Summit. Virginia Tech.

2021, Virtual Diversity Summit. Virginia Tech.

2021 ADVANCE Geo Bystander Training, Department of Biological Sciences, Virginia Tech.

2020 Strategies for Responding to Harassment and Bullying: Improving Workplace Climate Workshop. Virtual Evolution Conference 2020.

2020 Presented and attended VT Department of Biological Sciences Anti-Racist teaching group meetings (lead by Dr. L. Belden).

2019 ADVANCE Geo Bystander Training - Evo-Ally training program. Evolution 2019. Providence, RI.

Professional Service

Editorial Boards

2020-Present Associate Editor, *Systematic Biology*

Society Leadership

2018-2021 Society for Systematic Biology, Elected Council Member. *One of 15 councilors responsible for society leadership and organization.*

Professional Society Membership

Society of Systematic Biologists

Society for the Study of Evolution

Society of American Naturalists

Society for the Advancement of Chicanos/Hispanics and Native Americans in Science

Professional Outreach and Mentoring

2023-Present Faculty Mentor: SACNAS Chapter at Virginia Tech.

2020-2023 Invited Panelist. SSI Alumni Panel. California Academy of Sciences. Virtual. *Yearly participant in NSF REU panel with current undergraduate researchers.*

June 2022 SSE Student-Faculty Networking Lunch at Evolution 2022.

June 2019, 2022 Undergraduate diversity mentor, Evolution 2022.

June 2019, 2022 Safe Evolution: Evo-Ally Advocate at Evolution Conference.

Sept 2021 Facultea series (lead by M. Emori) discussion with students. Virginia Tech.

June 2021. ASN/SSE/SSB ECR² graduate student-faculty networking lunch. Online events for the Evolution meetings, 2021. Met with 4 students for 1 hr networking event and had additional 1 hr follow-up conversations with 2 of them.

June 2021. Lead Judge for Selection Committee of the Society of Systematic Biology's Excellence Symposium. Online Evolution Meetings.

March 2021 Invited Panelist. Faculty Panel: GTA Training and Development Workshop. Oregon State University, Department of Integrative Biology. Virtual.

March 2019 Mid-Atlantic Undergraduate Research Conference, Poster Judge.

June 2018 Undergraduate Student Mentoring Breakfast, Society for Systematic Biologists Conference, Columbus, OH.

Panel service

2021 National Science Foundation, Division of Environmental Biology.

Symposium Organizer

June 2019. *Beyond Tempo and Mode: Toward process-based models of macroevolutionary trait evolution.* Co-organized with Stacey Smith. Evolution 2019, Providence, RI.

Aug 2018. *The Macroevolutionary Dynamics of Form-Function Relationships.* Co-organized with Martha Munoz. Evolution 2018, Montpellier, France.

Expert Reviewer Service

National Science Foundation, Science, Proceedings of the National Academy of Sciences, Biology Letters, Current Biology, PLOS Biology, Evolution, The American Naturalist, Molecular Ecology (Top reviewer 2015), Systematic Biology, Methods in Ecology and Evolution, Ecology and Evolution, Journal of Human Evolution, Journal of Evolutionary Biology, Scientific Reports, Paleobiology, Proceedings Royal Society B, Axios, FONDECYT Chile, ROpenSci Software Review, Journal of Human Heredity, Nature Ecology and Evolution, New Phytologist, Nature Communications, Integrative and Comparative Biology

Virginia Tech Departmental and University Service

2024 Virginia Tech Biological Sciences Diversity Committee- Chair

2024 Virginia Tech Biological Sciences Executive and Promotions Committee. *Department administration, tenure, and promotion review.*

2024 Global Change Center Fellowship Review Committee.

2024 Center for Advancing Undergraduate Science Education Co-Director of Research Search Committee.

2023 Computational Biology/Bioinformatics Search Committee.

2017-Present EvoPhy Reading Group leader and organizer. *~15 weekly participants, meeting all semester 2017 to present.*

2020-Present Virginia Tech Biological Sciences Graduate Mentoring Committee. *Development and implementation of departmental policies on graduate and postdoc mentoring and review.*

2019-2024 Virginia Tech Biological Sciences Diversity Committee

2018-Present Global Change Center affiliated faculty

2021-2022 Virginia Tech Biological Sciences Executive and Promotions Committee. *Department administration, tenure, and promotion review.*

2017-2020 Biological Sciences Research Day Committee. *Organizing and implementing departmental research conference and recruiting day for prospective graduate students.*

2019 Search Committee, Department of Biological Sciences

Previous Departmental and University Service

2016-2017 Postdoc mentoring program, University of Idaho

2010-2012 Co-Founder (with S. Eddy) of BIO-GradS: Broader Impacts and Outreach by Graduate Students organization, Oregon State University.

Community outreach & extension

June 2022 Alumni Weekend Nature Tour, Virginia Tech.

Dec 2020 MuView with Mo Science Podcast Interview.

March 2-5, 2015 Darwin Day Roadshow, Craigmont & Moscow, ID (~200 students, 2 schools)

April 21, 2013 Palouse Discovery Science Center, Pullman, WA (60 students)

October 24, 2011 “Evolution and Ecology Workshop”, Corvallis, OR (80 students, 4 teachers)

July 22, 2011 “GEAR UP” Latino student outreach panel, Corvallis, OR (30 students)

December 2, 2010 “Discovery Nights” -Wilson Elementary School, Corvallis, OR (50 students)

November 10, 2010 Philomath High School presentation, Philomath, OR (30 students)

September 20, 2010 “Darwin’s Legacy Workshop”, OSU (65 students, 7 teachers)

July 2, 2010 Evolution Teacher workshop, OSU (14 high school teachers)

May 18, 2010 West Albany High School visit to OSU (35 students)

April 15, 2010 Illinois Valley High School visit to OSU (35 students)

2010-2011 Dallas High School, (2 visits to 3 classes, ~60 students)

March 7, 2009 Science Potpourri, OSU (20 students)

January 22, 2009 Mountain View Elementary School, Corvallis, OR (23 students)

Spring, 2008 Fir Grove Elementary School (30 students)

2007-2011 Myers Elementary, Salem, OR (annual visits, 300 students)

2007 & 2008 SMILE tours, OSU (3 tours to middle school classes)

2007-2009 Avery House Volunteer, Corvallis, OR (3 events, 60 participants)

2005 Earthwatch assistant (helped lead ~15 volunteers), Salem, OR

Additional Diversity, Equity, and Inclusion Work

2017-Present Lab recruiting. *I am grateful to have recruited an outstanding group of talented and diverse graduate students, postdocs and undergraduates to my lab. Over half of my combined current and former lab members (grads and postdocs) identify as Latinx, Black, and/or Indigenous, and over 50% have been international researchers from 5 different continents.*

2019-Present Virginia Tech Biological Sciences Diversity Committee. *Develop and implement departmental DEI initiatives, development of departmental documents and policies, inviting and hosting speakers, and facilitating faculty recruitment.*

2019, 2022 Undergraduate diversity mentor at Evolution 2022 (2019: Providence, RI, 2022: Cleveland, OH).

Oct 2020 Organized, designed, and helped staff the Virtual HBCU/MSI Summit VT Department of Biological Sciences Booth.

June 2020 Organized and moderated VT Biological Sciences Department Town Hall on Anti-Racist Action.