

Curtis Raymond Congreve

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Current Position: Lecturer at North Carolina State University
Specialization: Invertebrate Paleontology
Research Interests: Mass Extinctions, Phylogenetic Paleoecology, Earth Systems/Life Interactions

Education

2009-2013 PhD in Geology, University of Kansas (Advisor: Bruce Lieberman)
2006-2008 MS in Geology with Honors, University of Kansas (Advisor: Bruce Lieberman)
2002-2006 BS Geology, *magna cum laude*, University of Rochester

Professional Experience

2018-Present Lecturer, Marine Earth and Atmospheric Sciences, North Carolina State University
2017-2018 Part-time Lecturer, Department of Geosciences, Pennsylvania State Altoona
2013-2018 Post-Doctoral Fellow, Department of Geosciences, Pennsylvania State University (Mentor: Mark Patzkowsky)
2013 Teaching Assistant for the Department of Biology, University of Kansas
2010-2012 Collections Assistant for the Biodiversity Institute, University of Kansas
2006-2007;2012-2013 Teaching Assistant for the Department of Geology, University of Kansas

Publications

16 **Congreve, CR**, Wagner, PJ, and Patzkowsky ME. 2021. An early burst in brachiopod evolution corresponding with significant climatic shifts during the Great Ordovician Biodiversification Event. *Proceedings of the Royal Society B*. 288 (1958), 20211450

- 15 Sclafani, JA, **Congreve, CR**, and Patzkowsky, ME. 2021. Does evolutionary relatedness predict ecological similarity? *Paleobiology*. 47 (2), 284-300
- 14 Lamsdell, JC and **Congreve, CR**. 2021. Phylogenetic paleoecology: macroecology within an evolutionary framework. *Paleobiology*. 47 (2), 171-177
- 13 **Congreve, CR**, Krug, AZ, and Patzkowsky, ME. 2019. Evolutionary and biogeographical shifts in response to the Late Ordovician mass extinction. *Palaeontology*, 62(2) 267-285.
- 12 Sclafani, JA, **Congreve, CR**, Krug, AZ, and Patzkowsky, ME. 2018. Effects of mass extinction and recovery dynamics on long-term evolutionary trends: A morphological study of Strophomenida (Brachiopoda) across the Late Ordovician mass extinction. *Paleobiology*, 44(4) 603-619.
- 11 **Congreve, CR**, Falk, AR, and Lamsdell, JC. 2018. Biological hierarchies and the nature of extinction. *Biological Reviews*, 93(2) 811-826.
- 10 Lamsdell, JC, **Congreve, CR**, Hopkins, MJ, Krug, AZ, and Patzkowsky, ME. 2017. Phylogenetic Paleoecology: tree-thinking and ecology in deep time. *Trends in Ecology and Evolution*, 32(6) 452-463.
- 9 **Congreve, CR** and Lamsdell, JC. 2016. Implied weighting and its utility in palaeontological datasets: a study using modelled phylogenetic matrices. *Palaeontology*, 59(3) 447-462.
- 8 **Congreve, CR** and Krug, AZ and Patzkowsky, ME. 2015. Phylogenetic revision of the Strophomenida, a diverse and ecologically important brachiopod order. *Palaeontology*, 58(4) 743-758.
- 7 **Congreve, CR**. 2013. Cladal turnover: the end Ordovician as a large-scale analog of species turnover. *Palaeontology*, 56(6) 1285-1296.
- 6 Barge, LM and A Pulschen, APM Emygdio, **CR Congreve**, DE Kishimoto, AG Bendia, AMM Teles, J Demarines, D Stoupin. 2013. Life, the universe, and everything: an education outreach proposal to build a traveling astrobiology exhibit. *Astrobiology*, 13(3). 7 pp.
- 5 Gapp, IW and **CR Congreve** and BS Lieberman. 2012. Unraveling the phylogenetic relationships of the Eccoptochilinae, an enigmatic array of Ordovician cheirurid trilobites. *PLoS ONE*, 7(11).
- 4 **Congreve, CR** and BS Lieberman. 2011. Phylogenetic and biogeographic analysis of sphaerexochine trilobites. *PLoS ONE*, 6(6)
- 3 **Congreve, CR** and BS Lieberman. 2010. Phylogenetic and biogeographic analysis of deiphonine trilobites. *Journal of Paleontology*, 84(1), p. 128-136.
- 2 **Congreve, CR**. 2008. "The end Ordovician; an ice age in the middle of a greenhouse" p.9-19. *in Mass Extinction* ed: Elewa, A.M.T., Springer, Berlin.
- 1 **Congreve, CR** and BS Lieberman. 2008. Phylogenetic and biogeographic analysis of Ordovician homalonotid trilobites. *Bentham Open Paleontology Journal*, 1. p. 24-32.

Presentations

Talks

- 2022 **Congreve, CR**, Falk, AR, and Lamsdell, JC. *Geological Society of America Annual Meeting in Denver*. Dual Hierarchy Theory and the Enduring Legacy of Punctuated Equilibrium
- 2021 **Congreve, CR**, Patzkowsky, ME, and Wagner, PJ. *Geological Society of America Annual Meeting in Portland*. An early burst in brachiopod evolution corresponding with significant climatic shifts during the Great Ordovician Biodiversification Event.
- 2021 Lamsdell, JC and **Congreve, CR**. *Geological Society of America Annual Meeting in Portland*. Shadows of the past: The disjunct distribution of extant horseshoe crabs explained through biogeographic analysis of fossil taxa,
- 2020 Sclafani, JA, **Congreve, CR**, and Patzkowsky, ME. *Geological Society of America Annual Meeting*. Biogeographic Variation in Morphological Disparity of Strophomenida (Brachiopoda).
- 2020 Sclafani, JA, **Congreve, CR**, and Patzkowsky, ME. *Geological Society of America Annual Meeting*. Do Phylogenetic Relationships Predict Ecological Similarity?
- 2020 Anderson, BM, Lamsdell, JC, Falk, AF, and **Congreve, CR**. *American Malacological Society Annual Meeting*. Quantifying neglect of research for non-commercial marine species and the potential dangers of generalizing from limited ecological data.
- 2019 **Congreve, CR**, Sclafani, JA, Patzkowsky, ME. *GSA Annual Meeting in Phoenix*. Assessing the fit of environmental affinities to phylogenetic trees in strophomenoid brachiopods across the Ordovician mass extinction.
- 2019 **Congreve, CR**, Sclafani, JA, Patzkowsky, ME. *North American Paleontological Conference*. The impact of environmental preference and geographic occupation on diversification and survivorship during the Ordovician mass extinction.
- 2018 Sclafani, JA, **Congreve, CR**, Christie, M, Bourne, A, Gazze, C, Roselle, B, Patzkowsky, ME. *GSA Annual Meeting in Indianapolis*. Using phylogenetic trees and 3d morphometrics to understand ecological change during the Late Ordovician mass extinction and recovery.
- 2018 **Congreve, CR**, Patzkowsky, ME. *GSA Annual Meeting in Indianapolis*. The impact of biogeography on diversification and survivorship during the Ordovician mass extinction.
- 2017 **Congreve, CR**, Wagner, PJ, Patzkowsky, ME. *GSA Annual Meeting in Seattle*. Short or long fuse: Timing the Ordovician Radiation using the Fossilized Birth-Death Model
- 2016 **Congreve, CR**, Krug, AZ, Patzkowsky, ME. *GSA Annual Meeting in Denver*. Boom and bust; analyzing shifts in evolutionary rates of strophomenoid brachiopods during the Late Ordovician mass extinction using a phylogenetic framework.

- 2016 Christie, M, **Congreve, CR**, Patzkowsky, ME. *GSA Annual Meeting in Denver*. Phylogenetic diversity of the Lucinidae in the western Atlantic using fossils and molecules.
- 2016 Sclafani, JA, **Congreve, CR**, Krug, AZ, Patzkowsky, ME. *GSA Annual Meeting in Denver*. How similar are sisters? The relationship between morphology, ecology, and evolutionary history.
- 2015 Sclafani, JA, **Congreve, CR**, Krug, AZ, Patzkowsky, ME. *GSA Annual Meeting in Baltimore*. Dynamics of extinction and recovery: A study of morphospace shifts during and after the Late Ordovician Mass Extinction
- 2015 Krug, AZ, **Congreve, CR**, Patzkowsky, ME. *GSA Annual Meeting in Baltimore*. Differential Recovery from clustered originations in the recovery from the Late Ordovician Mass Extinction
- 2015 Patzkowsky, ME, **Congreve, CR**, Krug, AZ, Sclafani, JA. *GSA Annual Meeting in Baltimore*. Onshore-offshore patterns of Ordovician diversification in the brachiopod order Strophomenida: A phylogenetic perspective
- 2015 **Congreve, CR** and Lamsdell, JC. *GSA Annual Meeting in Baltimore*. Implied weighting and its utility in phylogenetic paleontological datasets: A study using modelled phylogenetic matrices
- 2014 **Congreve, CR**, Krug, AZ, Patzkowsky, ME. *GSA Annual Meeting in Vancouver*. Phylogenetic patterns of strophid brachiopods and their relationship to the Ordovician Mass Extinction Event
- 2013 **Congreve, CR**. *GSA Annual Meeting in Denver*. Cladal Turnover: The End-Ordovician Mass Extinction Event as a large scale analog of Vrba's Relay Model
- 2012 **Congreve, CR** and G Kloc. *GSA Annual Meeting in Charlotte*. Phylogenetic and taxonomic revision of ceraurid trilobites
- 2011 **Congreve, CR** and BS Lieberman. *GSA Annual Meeting in Minneapolis*. Quantifying catastrophe: Estimating speciation and extinction rates in trilobites during the End Ordovician Mass Extinction Event
- 2010 **Congreve, CR** and BS Lieberman. *GSA Annual Meeting in Denver*. Mass extinctions as large-scale analogues of species turnover: A study of the End Ordovician Mass Extinction Event
- 2010 **Congreve, CR**. *International Palaeontological Congress 3 in London*. The Great Equalizer of Evolutionary Biology; Mass extinctions as large-scale analogues of species turnover
- 2009 **Congreve, CR** and BS Lieberman. *GSA Annual Meeting in Portland*. Biogeographic and phylogenetic patterns of two groups of cheirurid trilobites during the End Ordovician Mass Extinction
- 2008 **Congreve, CR**. *GSA Annual Meeting in Houston*. Biogeographic and phylogenetic patterns of trilobites during the End Ordovician Mass Extinction

Invited Talks

- 2020 **Congreve, CR.** *North Carolina Museum of Natural History Darwin Days.* The Late Ordovician Mass Extinction: Ecological Collapse in Ancient Oceans.
- 2019 **Congreve, CR.** *Lincoln Scholars invited talk for Centre College.* From climate change to paleobiology: The importance of Earth Science literacy.
- 2017 **Congreve, CR.** *West Virginia University colloquium.* The importance of mass extinctions: a study of the evolutionary impact of the Late Ordovician mass extinction event.
- 2009 **Congreve, CR.** *Kansas and Missouri Paleontological Society.* Phylogenetic and biogeographic studies of the End Ordovician Mass Extinction Event

Posters

- 2015 Christie, M, Patzkowsky, ME, **Congreve, CR.** *GSA Annual Meeting in Baltimore.* Phylogenetic diversity of the Lucinidae from the Pliocene to Modern in the Western Atlantic
- 2015 Krug, AZ, **Congreve, CR,** Patzkowsky, ME. *AbSciCon Meeting in Chicago.* The impact of the Late Ordovician Mass Extinction on the tree of life
- 2005 **Congreve, CR** and DD Gillette, LB Albright, LA Newcomb. *GSA Annual Meeting in Salt Lake City.* High density population of the oyster *Pycnodonte newberryi* (Stanton) in the Tropic Shale (Cenomanian-Turonian) of the Kaiparowits Basin, Southern Utah

Teaching Experience

North Carolina State University

- 2018-Present **Instructor for MEA 101 “Physical Geology”;** undergraduate introductory geology course about the physical processes that shape the Earth.
- Instructor for MEA 101-601 “Physical Geology”;** distance learning section of introductory geology.
- Instructor for MEA 100 “Earth Systems Science”;** undergraduate course focusing on understanding the Earth as a series of interacting systems and using this systems approach to understand past and present changes.

Pennsylvania State University – Altoona Campus

- 2018 **Instructor for GEOG 115 “Landforms of the World”;** a general education course on physical geography, focusing on how Earth systems processes form landforms.

2017 **Instructor for GEOSCI 001 “Physical Geology”**; undergraduate introductory geology course about the physical processes that shape the Earth and an accompanying lab.

Pennsylvania State University – University Park Campus

2017 **Instructor for EAR 002 “Earth Systems for Continuing Education”**; a general education course open to both undergraduates and continuing education students that focuses on understanding the Earth as a series of interacting systems and using this systems approach to understand past and present changes.

Co-Leader for AfricaArray REU; undergraduate summer research program with a three-week trip to the Bushveld Igneous Complex in South Africa to teach students about geochemistry and geophysics in the field.

2016 **Instructor for EAR 100 “Environment Earth”**; undergraduate general education course about environmental science and human effects on Earth systems processes.

2015 **Instructor for “Phylogenetics and the Fossil Record”**; graduate course teaching theory and best practices for phylogenetic methods.

University of Kansas

2013 **Online Distance Learning Lecturer for “History of the Earth”**; undergraduate course focused on biological and geological changes through Earth history

2013 **Lab TA for “Principles of Biology Laboratory”**; introductory biology lab focusing on systematics, evolution, anatomy (dissections), and ecology

2012 **TA for “Carbonate Petrology”**; upper level undergraduate course focusing on the processes that form sedimentary rocks

2006-2007 **Lab TA for “Geology Fundamentals Laboratory”**; introductory geology lab focusing on core principles of geology, sedimentology, geophysics, and paleontology

TA for “Prehistoric Life: DNA to Dinosaurs”; introductory undergraduate course on paleobiology

Graduate Research Committees Served On

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| 2020-2021 | Namiko Machida, PhD. West Virginia University (outside committee member)
“Evaluation of environmental constraints on the heterochronic evolution of trilobite suborder Phacopina” |
| 2017-2019 | James Beech, Masters. West Virginia University (outside committee member).
“Death Defying Morphologies: Extinction and Disparity in the order Harpetida” |
| 2017-2019 | Emily Hughes, Masters. West Virginia University (outside committee member).
“Discerning the Diets of Sweep-Feeding Eurypterids through Analyses of Mesh-Modified Appendage Armature” |

Professional and Community Services

Symposiums organized

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| 2021 | Co-Organizer of GSA session “Phylogenetic Paleobiology: Combining Evolutionary Trees and Fossils to Understand the Evolution of Life” |
| 2019 | Co-Organizer of GSA session, “Phylogenetic Paleobiology; Good things come in trees” |
| 2018 | Co-organizer of GSA session, “Phylogenetic Paleocology; Macroecology within an Evolutionary Framework” |
| 2014 | Co-organizer of GSA session, “Unearthing the History of Life: The Application of Phylogenetic Methods to the Fossil Record.” |
| 2010 | Co-organizer of IPC3 session, “Macroevolution and the Modern Synthesis” |

Editorial Work

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| 2019-2021 | Editor for special volume of <i>Paleobiology</i> from GSA symposium “Phylogenetic Paleocology; Macroecology within an Evolutionary Framework” |
| 2011-2013 | Editor for special volume of <i>Palaeontology</i> from IPC3 symposium “Macroevolution and the Modern Synthesis” |

Professional Memberships

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| 2008-Present | Paleontological Society |
| 2005-2019 | Geological Society of America |

Journals Reviewed For

Journal of Paleontology, Palaeontology

Outreach

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| 2020-2021 | Guest lectures for Wake County Middle Schools |
| 2011-2012 | Participated in University of Kansas Natural History Museum Fossil Identification Day |
| 2009-2012 | Participated in fossil hunt children's activity for the Kansas City Gem and Mineral Show |

Fellowships, Awards and Honors

Small Grants

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| 2011 | Panorama Grant from the Biodiversity Institute, University of Kansas |
| 2011 | AWG Summer Research Grant, University of Kansas |
| 2011 | Geology Summer Research Funding, University of Kansas |
| 2010 | The Association of Earth Science Clubs of Greater Kansas City Scholarship |
| 2008 | Panorama Grant from the Biodiversity Institute, University of Kansas |

Computer Skills

Phylogenetic Software

TNT Tree Analysis Using New Technology, PAUP4*, MrBayes, Mesquite, Morphobank, Figtree

Teaching Software

Moodle, Top Hat, Blackboard, CANVAS, ANGEL, Starfish, iClicker.

Statistical/Mapping/Publishing Software

Minitab, R, ArcGIS, Microsoft Excel, PowerPoint, Word, Photoshop, Illustrator, Acrobat,

Collections Software

Specify

Field Work

2019	Fossil collecting and mapping across the Early Devonian Appalachian Basin near Smokehole Caverns, WV
2018	Fossil collecting in the Late Silurian to Early Devonian near Altoona and Bellwood, PA
2011	Trilobite collecting in the Napanee Formation near Rome, NY
2010	Trilobite collecting in the Kimmswick Formation near St Louis, MO
2009	Trilobite collecting in the Leray? Beds near Ottawa, ON and the Sugar River Formation near Watertown, NY