

# Nan Crystal Arens

Professor of Geoscience  
Hobart & William Smith Colleges

## Curriculum Vitae

### Education

B.S. with high distinction in Earth Science, minor in technical writing  
(thesis in invertebrate paleontology)  
The Pennsylvania State University 1987

M.S. in Geology (thesis in invertebrate paleontology)  
The Pennsylvania State University 1988

M.A. in Biology (paper in fossil plant autecology)  
Harvard University 1991

Ph.D. in Biology (thesis in Carboniferous vascular plant paleoecology)  
Harvard University 1993

### Employment

Assistant Professor of Integrative Biology, University of California at Berkeley 1993-2002

Curator of Fossil Plants in the Museum of Paleontology, University of California at Berkeley 1993-2002

Assistant Professor of Geosciences, Hobart & William Smith Colleges 2001-2005

Associate Professor of Geoscience, Hobart & William Smith Colleges 2005-2015

Professor of Geoscience, Hobart & William Smith Colleges 2015-present

Senior Dean of Faculty, Hobart & William Smith Colleges 2017-1018

Classes of 1964 Endowed Professor, Hobart & William Smith Colleges (2023-2028)

**Languages** English (native), Spanish (conversational), French (reading), ASL (conversational)

### Fellowships and Honors

Phi Beta Kappa, Lambda of Pennsylvania, Zeta of New York

Alpha Lambda, Phi Eta Sigma, Tri-Alpha and Golden Key honoraries

New England Scholastic Press Association Journalism Award (1979)

Penn State Earth Science Marshall (1987)

Teaching Assistant (Penn State, Geosciences) (1987-1988)

Teaching Fellow (Harvard, Biology) (1988-1993)

Certificate of Distinction in Teaching (Harvard) (1990, 1992, 1993)

Regents' Junior Faculty Fellowship—University of California (1998)

Hobart & William Smith Colleges Civically Engaged Faculty Award (2013)

Hobart & William Smith Colleges Faculty Scholarship Award (2016)

### **Grants in Support of Research**

Sigma Xi Research Grant (1990)  
Geological Society of America Research Grant research (1990)  
NATO Post Doctoral Fellowship in Science and Engineering research (1993-1994)  
1994-1995 Junior Faculty Research Grant, UCB research (\$10,000)  
1995-1996 Junior Faculty Mentor Grant, UCB research (\$10,000)  
National Geographic Society Research Grant research (1995-1999) (\$15,948)  
Regents' Junior Faculty Fellowship research (1998)  
Pacific Rim Research Grant research (1998-1999) (\$14,050)  
American Chemical Society Petroleum Research Fund research (1999-2003) (\$60,000)  
Helman Foundation Research Grant research (1999-2000) (\$30,000)  
UCB Biology Faculty Research Award research (2000-2001) (\$40,000)  
NSF EAR-0123257 research (2001-2003) (\$17,442)  
American Chemical Society Petroleum Research Fund research (2009-2012) (\$28,026)

### **Grants in Support of Service**

Horizon Foundation in support of Seneca Roots & Shoots (2012, \$2,500) (2013, \$2,500)  
(2014, \$1,000) (2015, \$1,000)  
Wyckoff Family Foundation in support of Seneca Roots & Shoots (2013, \$1,500) (2014,  
\$1,500) (2015, \$1,950) (2016, \$1,600) (2017, \$2,500) (2018, 2,700) (2019, \$2,500)

### **Field Experience**

Paleontology of Ordovician carbonates, Central Appalachians for Senior Thesis (1986-1987)  
Undergraduate Geology Field Camp, western United States (1987)  
Paleobiology of Ordovician carbonates, Central Appalachians for Master Thesis (1987-1988)  
Geology of Paleozoic sediments, Southern Appalachians (1988-1989)  
Pleistocene paleoecology of New England forests (1989)  
Paleoecology of Carboniferous, Nova Scotia, Canada for Ph.D. Thesis (1989-1992)  
Tropical plant ecology, Venezuela (1991)  
Tropical plant ecology, Costa Rica (1991)  
Tropical plant and community ecology, paleoecology, Colombia (1991-1993)  
Natural history of the tree fern *Cyathea*, Colombia (1992-1995)  
Cretaceous paleobotany and K-T boundary, Guajira and Cordillera Oriental, Colombia  
(1993-1999)  
Paleoecology of Carboniferous paleosols in the Central Appalachians and western North  
America (1994-1996)  
Sedimentation of organic particles, modern analog work in Jamaica (1997)  
Late Cretaceous paleobotany, stratigraphy and K-T boundary, northeastern Montana (1997-  
present), North Dakota (1998-2000)  
Geology of Australia and New Zealand (2003, 2008, 2010)  
Mid Cretaceous paleobotany of southeastern Utah (2005-present)  
Ecology and climate reconstruction in Australian (Queensland) moist forests (2010)  
Sedimentary geology, marine ecology, paleobiology and environmental impact on San  
Salvador Island, Bahamas (2012-present)  
Mesozoic sediments of Mendoza Province, Argentina (2013)

## **Synergistic Activities**

- Reporter for the *Daily Collegian*, State College, Pennsylvania (1982-1986)
- Public Relations writer for the College of Science and College of Earth and Mineral Science, Penn State (1984, 1987-1988)
- Freelance science writer (1984-1988)
- Tutor in math and science for learning-disabled students, Penn State (1987-1988)
- Earth History and Paleobiology Seminar Series coordinator, Harvard (1989-1991, 1992-1993)
- Adjunct Professor, Department of Biology, Universidad del Valle, Cali, Colombia (1994-1996)
- Invited lecture at Penn State Earth System Science Center conference "Atmospheric Oxygen through the Phanerozoic" (July 1990)
- Invited professor "Curso de Ecología Tropical y Biología de la Conservación" Reserva Natural La Planada, Nariño, Colombia (1992)
- Invited lecturer Universidad de Antioquia, Medellín, Colombia (April 1994)
- Invited lecturer Universidad del Valle, Cali, Colombia (May 1994)
- Invited Keynote Lecture at 1° Congreso Nacional Sobre Biodiversidad, Santiago de Cali, Colombia, December 4-7, 1994.
- Invited lecturer University of Chicago Evolutionary Biology Series (1996)
- Field trip leader: Tertiary Floras of California and Nevada for IOPC-V (1996)
- Invited lecture in paleoecology, Georgia Institute of Technology (1997)
- Invited lecture in geology, University of Oregon (1998)
- Sigma Delta Epsilon—Graduate Women in Science Vessa Notchev Fellowship Committee 1997-2005 (chair 2000-2005).
- Paleontological Society—nominations committee 2001-2004 (chair 2003-2004)
- Invited lectures at Syracuse University (2002) and Johns Hopkins University (2004)
- Invited lecture Rochester Academy of Sciences (2004)
- Contributing editor, *Omnificent English Dictionary in Limerick Form* (OEDILF.com) (2007)
- Geological Society of America Research Grants Committee (2008-2011)
- Associate Editor, *American Fern Journal* (2011-2016)
- Invited participant, *The Sixth Mass Extinction: Paleobiology, Ecology and Ethics*, Colgate University, 16-18 March 2012.
- Leader, Seneca Roots & Shoots after school program for the Geneva Boys & Girls Club 2009-2022
- Chair, HWS Committee on the Faculty, 2014-2016
- Keynote Speaker, *Sacred Texts and Human Contexts: A Symposium on Nature and the Environment in World Religions*, Nazareth College, Rochester, NY, 24 June 2016.
- HWS Posse 4 Mentor (2016-2020) [www.PosseFoundation.org](http://www.PosseFoundation.org)
- Paleontological Research Institute Board of Trustees (2019-present) Vice President (2021-present) Chair Science Committee (2019-present)

### **Research Interests**

- (1) The evolution of terrestrial environments and the interplay between physical environmental change (e.g., climate and atmosphere) and changes in community composition and structure.
- (2) Evolution of plant autecology and eco-morphology.
- (3) Early angiosperm ecology and evolution.
- (4) Extinction mechanisms.
- (5) CLAMP climate reconstruction and the role of phylogeny and biogeography.
- (6) Role of origination in macroevolutionary process
- (7) College-level learning in geoscience.
- (8) Microplastics sources, transport and sinks in the Finger Lakes watershed.

### **Graduate Students—UC Berkeley**

- Mateo C. Rutherford (1995-2000 MS)— “A field key to the tree ferns of Costa Rica.”  
Caroline A.E. Strömberg (1997-2003 PhD)— “The evolution of grass-dominated biomes in the Neogene of North America: Testing hypotheses of mammalian adaptation.”  
Anna Thompson (1997-2003 MS)— “A developmental perspective on fossil leaf systematics: An example from the Fox Hills Formation, northeastern Montana.

### **Post-Doctoral Researchers—UC Berkeley**

- Dr. Yan-ju Liu (1998-1999)— “Distribution of climate sensitive conifers in time and space: A model for understanding the role of climate change in species extinction and range change”  
Dr. Taylor Feild (2001-2002) — “Ecophysiological evolution of early angiosperms” Miller Postdoctoral Fellow, University of California, Berkeley.

### **Honors Students—Hobart & William Smith**

- Sarah E. Allen (2009) — “A florule from the base of the Hell Creek Formation, Garfield County, Montana: Implications for diversity, climate and environment”  
Elisha B. Harris (2010) — “A mid-Cretaceous angiosperm-dominated flora from the Cedar Mountain Formation of Utah: Diversity and climate”  
Mikhail Fischer (2017) — “A phenetic approach to recognizing OTUs in modern leaves”  
Caroline Carr (2017) — “Phenetics as an effective approach to classify Late Cretaceous angiosperm macrofossils”  
Jonas Toupal (2019) — “Remote sensing mapping of mercury contamination in vegetated areas: The case of Tarkwa, Ghana, Africa”  
Jacob Kotcher (2020) — “Origination in the Phanerozoic”  
Chase W. Bell (2022) — “First Look at Microplastics in the Human Water Cycle of Seneca Lake, Finger Lakes Region of New York, USA”  
Heather Kerns (2023) — “Investigation of the Sources of Microplastic Fibers in Seneca Lake: An Analysis of Fiber Lengths”

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## Publications

### Peer-Reviewed Publications

- (39) Arens, Nan Crystal, Levi Holguin\* and Natalie Sandoval\* (submitted) Repairing the scaffolding: Women Authors in *Paleobiology*. *Paleobiology*.
- (38) **Arens, Nan Crystal**, Chase W. Bell\*, Heather E.L. Kerns\*, William R. Lewis\* and Madeleine G. Meyer\* (submitted) Microplastic in precipitation: A significant, variable and diffuse pollution source. *Environmental Science & Technology, Air*.
- (37) Toupal\*, Jonas, Kristen Brubaker and **Nan Crystal Arens** (submitted) Remote sensing mapping of mercury contamination in vegetated areas: The cases of Tarkwa, Ghana and Tongguan, China. *Environmental Pollution*.
- (36) Brett St. Pierre,\* **Nan Crystal Arens** and Diana L. Boyer (in revision) Turonian to Early Coniacian age for clays of Martha's Vineyard, Massachusetts, U.S.A. *Palynology*.
- (35) Fisher, Emily and **Nan Crystal Arens** 2020 Geoscience education and motivated reasoning: Learning about climate change. *Journal of College Science Teaching* 49:5:36-41.
- (34) **Arens, Nan Crystal**. 2019. Abrogated authority: A failed experience with research in an introductory geology classroom. *Transformations: The Journal of Inclusive Scholarship and Pedagogy* 28:2:188-194.
- (33) Harris,\* Elisha B. and **Nan Crystal Arens** 2016 A mid-Cretaceous angiosperm-dominated macroflora from the Cedar Mountain Formation of Utah. *Journal of Paleontology* 90:4:640-662.
- (32) **Arens, Nan Crystal** and Joseph P. Gleason\* 2016 Insect folivory in an angiosperm-dominated flora from the mid-Cretaceous of Utah, U.S.A. *Palaios* 31:71-80.
- (31) Yang, Jian, Robert A. Spicer, Teresa E.V. Spicer, **Nan Crystal Arens**, Frédéric M.B. Jacques, Tao Su, Elizabeth M. Kennedy, Alexi B. Herman, David C. Steart, Gaurav Srivastava, Rakesh C. Mehrotra, Paul J. Valdea, Naresh C. Mehrotra, Zhe-Kun Zhou and Jiang-Shan Lai. 2015. Leaf form-climate relationships on the global stage: An ensemble of characters. *Global Ecology and Biogeography* doi: 10.1111/geb.12334.
- (30) **Arens, Nan Crystal** and Elisha B. Harris\* 2015 Palaeoclimatic reconstruction for the Albian–Cenomanian transition based on a dominantly angiosperm flora from the Cedar Mountain Formation, Utah, USA. *Cretaceous Research* 53:140-152.
- (29) Kennedy, Elizabeth M., **Nan Crystal Arens**, Tammo Reichgelt, Robert A. Spicer, Teresa E.V. Spicer, Lena Stranks and Jian Yang. 2014. Deriving temperature estimates from Southern Hemisphere leaves. *Palaeogeography, Palaeoclimatology, Palaeoecology* 412: 80-90.

\* Undergraduate student co-author

- (28) **Arens, Nan Crystal** and Sarah E. Allen\*. 2014. A florule from the base of the Hell Creek Formation in the type area of eastern Montana: Implications for vegetation and climate. G.P. Wilson, W.A. Clemens, J. Horner and J. Hartman (eds.) *Through the End of the Cretaceous in the Type Locality of the Hell Creek Formation in Montana and Adjacent Areas. Geological Society of America Special Publication 503: 173-207.*
- (27) **Arens, Nan Crystal**, Anna Thompson and A. Hope Jahren. 2014. Vegetation indicators of environmental change preceding the Cretaceous/Paleogene boundary: Implications for the press/pulse model of mass extinction. G.P. Wilson, W.A. Clemens, J. Horner and J. Hartman (eds.) *Through the End of the Cretaceous in the Type Locality of the Hell Creek Formation in Montana and Adjacent Areas. Geological Society of America Special Publication 503:209-227.*
- (26) **Arens, Nan Crystal**, A. Hope Jahren and David C. Kendrick. 2014. Carbon isotope stratigraphy and correlation of plant megafossil localities in the Hell Creek Formation of eastern Montana, U.S.A. G.P. Wilson, W.A. Clemens, J. Horner and J. Hartman (eds.) *Through the End of the Cretaceous in the Type Locality of the Hell Creek Formation in Montana and Adjacent Areas. Geological Society of America Special Publication 503: 149-171.*
- (25) Jahren, A. Hope and **Nan Crystal Arens**. 2009. Prediction of atmospheric  $\delta^{13}\text{CO}_2$  using plant cuticle isolated from fluvial sediment: Tests across a gradient in salt content. *Palaios* 24:394-401.
- (24) **Arens, Nan Crystal** and Ian D. West\*. 2008. Press-Pulse: A general theory of mass extinction? *Paleobiology*: 34:456-471.
- (23) Jahren, A. Hope, **Nan Crystal Arens**, and Stephanie A. Harbeson. 2008. Prediction of atmospheric  $\delta^{13}\text{CO}_2$  using fossil plant tissues. *Reviews of Geophysics* 46: RG1002, doi:10.1029/2006RG000219. [electronic journal]
- (22) Feild, Taylor S. and **Nan Crystal Arens**. 2007. The ecophysiology of early angiosperms. *Plant, Cell and Environment* 30:291-309.
- (21) Liu, Yan-Ju, **Nan Crystal Arens** and Cheng-Sen Li. 2007. Range change in *Metasequoia*: Relationship to paleoclimate. *Botanical Journal of the Linnean Society* 154:115-127.
- (20) Liu, Yan-Ju, Yu-Jing Mu, Yong-Guan Zhu, Hui Ding and **Nan Crystal Arens**. 2006. Which ornamental plant species effectively remove benzene from indoor air? *Atmospheric Environment* 41:650-654.
- (19) Feild, Taylor S. and **Nan Crystal Arens**. 2005. Form, function and environments of the early angiosperms: Merging extant phylogeny and ecophysiology with fossils. *New Phytologist* 166:383-408.
- (18) Jahren, A. Hope, Clinton P. Conrad, **Nan Crystal Arens**, Germán Mora, Carolina Lithgow-Bertelloni. 2005. A plate tectonic mechanism for methane hydrate release along subduction zones. *Earth and Planetary Science Letters* 236:691-704.

\* Undergraduate student co-author

- (17) Feild, Taylor S., **Nan Crystal Arens**, James A. Doyle, Todd E. Dawson and Michael J. Donoghue. 2004. Dark and Disturbed: A new image of early angiosperm ecology. *Paleobiology* 30:82-107.
- (16) Feild, Taylor S., **Nan Crystal Arens** and Todd E. Dawson. 2003. The ancestral ecology of flowering plants: Emerging perspectives from extant basal lineages. *International Journal of Plant Science* 164 (Suppl. 3):S129-S142.
- (15) **Arens, Nan Crystal** and A. Hope Jahren. 2002. Chemostratigraphic correlation of four fossil-bearing sections in southwestern North Dakota. J.H. Hartman, K.J. Johnson and D.J. Nichols (eds.) The Hell Creek Formation and the Cretaceous-Tertiary boundary in the Northern Great Plains: An integrated continental Record of the end of the Cretaceous. *Geological Society of America Special Paper* 361:75-93.
- (14) **Arens, Nan Crystal**. 2001. Variation in performance of the tree fern *Cyathea caracasana* (Cyatheaceae) across the successional mosaic of an Andean cloud forest. *American Journal of Botany* 88:545-551.
- (13) Wilson, Gregory P. and **Nan Crystal Arens**. 2001. The evolutionary impact of an epeiric seaway on Late Cretaceous and Paleocene Palynofloras of South American. *Publicaciones Especiales de la Asociación Paleontológica Argentina* 7:185-189.
- (12) Jahren, A. Hope, **Nan Crystal Arens**, Gustavo Sarmiento, Javier Guerrero and Ronald Amundson. 2001. A terrestrial record of methane hydrate dissociation in the Early Cretaceous. *Geology* 29:159-162.
- (11) **Arens, Nan Crystal** and A. Hope Jahren. 2000. Carbon isotope excursion in atmospheric CO<sub>2</sub> at the Cretaceous-Tertiary boundary: Evidence from terrestrial sediments. *Palaios* 15:314-322.
- (10) **Arens, Nan Crystal** and Patricia Sánchez Baracaldo. 2000. Variation in tree fern stipe length with canopy height: Tracking preferred habitat through morphological change. *American Fern Journal* 90:1-15.
- (9) **Arens, Nan Crystal**, A. Hope Jahren and Ronald Amundson. 2000. Can C<sub>3</sub> plants faithfully record the isotopic composition of atmospheric carbon dioxide? *Paleobiology* 26:137-164.
- (8) **Arens, Nan Crystal** and Patricia Sánchez Baracaldo. 1998. Distribution of tree ferns (Cyatheaceae) across the successional mosaic in an Andean cloud forest, Nariño, Colombia. *American Fern Journal* 88:60-71.
- (7) **Arens, Nan Crystal** and Alan R. Smith. 1998. *Cyathea planadae*, a remarkable new creeping tree fern from Colombia, South America. *American Fern Journal* 88:49-59.

- (6) **Arens, Nan Crystal**. 1997. Responses of leaf anatomy to light environment in the tree fern *Cyathea caracasana* (Cyatheaceae) and its application to some ancient seed ferns. *Palaios* 12:84-94.
- (5) **Arens, Nan Crystal**. 1995. Los orígenes históricos de la biodiversidad de Colombia. *Memorias del 1° Congreso Nacional sobre Biodiversidad*, Santiago de Cali, pp. 17-23.
- (4) **Arens, Nan Crystal**. 1991. Wildfire in the Paleozoic: Preliminary results of a case study on the fire ecology of a Pennsylvanian floodplain forest, Joggins, Nova Scotia, Canada. In: Stephen C. Nodvin and Thomas Waldrop. *Fire and Environment: Ecological and Cultural Perspectives*. Southeastern Forest Experiment Station, Asheville, North Carolina, pp. 279-288.
- (3) **Arens, Nan Crystal** and R.J. Cuffey. 1989. Shallow and stormy: Late Middle Ordovician paleoenvironments in Central Pennsylvania. *Northeastern Geology* 11:218-224.
- (2) **Arens, Nan Crystal** and R.J. Cuffey. 1989. Bryozoan fauna of the Coburn and Salona limestones (Middle Ordovician) of Central Pennsylvania. *Journal of the Pennsylvania Academy of Science* 63:113-121.
- (1) **Arens, Nan Crystal** and A. Traverse. 1989. The effect of microwave oven-drying on the integrity of spore and pollen exines in herbarium specimens. *Taxon* 38:394-403.



### **Non-Peer-Reviewed Scholarly and Popular Publications**

(R32) Arens, Nan Crystal. 2019. Ecology and geomorphology of Zurich Bog. *Guidebook of the 91<sup>st</sup> Annual Meeting of the New York State Geological Association*, pp. A4: 1-9.

(R31) **Arens, Nan Crystal**. 2013. Making sense of life. A review of *Evolution: Making Sense of Life. This View of Life* [http://www.thisviewoflife.com/index.php/magazine/book\\_review/making-sense-of-life](http://www.thisviewoflife.com/index.php/magazine/book_review/making-sense-of-life).

(R30) **Arens, Nan Crystal**. 2013. The buzz on historical science. A review of *Honeybee Democracy*, *The SDG-GWIS Bulletin* 74:2:6-7 (reprinted from *American Paleontologist*).

(R29) **Arens, Nan Crystal**. 2013. Plant, fossil vertebrate, and marine invertebrate records. In *Grzimek's Animal Life Encyclopedia: Extinction*, Gale Cengage Learning, pp. 187-196.

(R28) **Arens, Nan Crystal**. 2013. Fossil and modern plant extinctions. In *Grzimek's Animal Life Encyclopedia: Extinction*, Gale Cengage Learning, pp. 299-307.

(R27) **Arens, Nan Crystal**. 2013. How to write a definitive book in the 21<sup>st</sup> Century. *This View of Life* [www.thisviewoflife.com/index.php/magazine/articles/how-to-write-a-definitive-book-in-the-21st-century](http://www.thisviewoflife.com/index.php/magazine/articles/how-to-write-a-definitive-book-in-the-21st-century).

(R26) **Arens, Nan Crystal**. 2012. Children of the Ice Age. A review of *The Climate Connection: Climate Change and Modern Human Evolution*. *American Paleontologist* 19:4:28-30.

(R25) **Arens, Nan Crystal**. 2011. In pursuit of the time machine. *Britannica Blog From the Field*. 22 November 2011.

(R24) **Arens, Nan Crystal**. 2011. The buzz on historical science. A review of *Honeybee Democracy*. *American Paleontologist* 19:3:28-29.

(R23) **Arens, Nan Crystal**. 2011. Plants in Mesozoic time: The legacy of Ted Delevoryas. A review of *Plants in Mesozoic Time: Morphological Innovations, Phylogeny, Ecosystems*. *American Paleontologist* 19:2:30-31.

(R22) **Arens, Nan Crystal**. 2010. Teaching paleobotany in the 21<sup>st</sup> century. A review of *An Introduction to Plant Fossils*. *American Paleontologist* 18:4:28-29.

(R21) **Arens, Nan Crystal**. 2010. Marching orders for science. A review of *For the Rock Record: Geologists on Intelligent Design*. *American Paleontologist* 18:3:29-31.

(R20) Archibald, David J., W.A. Clemens, Kevin Padian, Timothy Rowe, Norman MacLeod, Paul M. Barrett, Andrew Gale, Pat Holroyd, Hans-Dieter Sues, **Nan Crystal Arens**, John R. Horner, Gregory P. Wilson, Mark B. Goodwin, Christopher A. Brochu, Donald L. Lofgren, Stuart H. Hurlbert, Joseph H. Hartman, David A. Eberth, Paul B. Wignall, Philip J. Currie, Anne Weil, Guntupalli V.R. Prasad, Lowell Dingus, Vincent Courtillot, Angela Milner, Andrew

Milner, Sunil Bajpai, David J. Ward and Ashok Sahni. 2010. Cretaceous extinctions: Multiple causes. *Science* 328:973.

(R19) 2010 articles for *Encyclopaedia Britannica* on the following topics:  
*Archaeofructus* [<http://www.britannica.com/EBchecked/topic/1672415/Archaeofructus>].  
*Eospermatopteris* [<http://www.britannica.com/EBchecked/topic/1695861/Eospermatopteris>].  
*Cycadeoidea* [<http://www.britannica.com/EBchecked/topic/1695860/Cycadeoidea>].

(R18) **Arens, Nan Crystal**. 2010. Subtlety in green. A review of *Plants and the K-T Boundary*. *American Paleontologist* 18:1:online supplement  
[http://www.museumoftheearth.org/files/pubtext/supplements/suppl\\_17.pdf](http://www.museumoftheearth.org/files/pubtext/supplements/suppl_17.pdf).

(R17) **Arens, Nan Crystal**. 2009. Damp, dark, disturbed, and destined for dominance: The ecology of early flowering plants. *American Paleontologist* 17:2:10-14.

(R16) **Arens, Nan Crystal**. 2009. For the love of spores. A review of *Paleopalynology*, 2<sup>nd</sup> Edition. *American Paleontologist* 17:1:41-42.

(R15) **Arens, Nan Crystal**. 2008. And then there was one. A review of *The Last Human: A Guide to Twenty-Two Species of Extinct Humans*. *American Paleontologist* 16:2:41-42.

(R14) **Arens, Nan Crystal**. 2008. The antipodean Stephen Jay Gould? A review of *Chasing Kangaroos* by Tim Flannery. *American Paleontologist* 16:1:33-34.

(R13) West\*, Ian Derrick and **Nan Crystal Arens**, 2008. Humanity as press and pulse in the modern mass extinction. *Public Affairs Journal* 4:17-22.

(R12) **Arens, Nan Crystal**. 2005. Extinction: past as key to the present. *Trends in Ecology and Evolution* 20:365.

(R11) **Arens, Nan Crystal**. 2002. Arthropods hit the beach early. *Trends in Ecology and Evolution* 17:354.

(R10) **Arens, Nan Crystal**. 2002. Testing hypotheses in historical sciences. *Trends in Ecology and Evolution* 17:206.

(R9) **Arens, Nan Crystal**. 2002. Phanerozoic biodiversity: rocks or real? *Trends in Ecology and Evolution* 17:160.

(R8) **Arens, Nan Crystal**. 2002. Review of *Plants Invade the Land: Evolutionary & Environmental Perspectives*, edited by P.G. Gensel and D. Edwards. *Ecoscience* 9:415.

(R7) **Arens, Nan Crystal**. 2001. Taking the gas out of paddy rice. *Trends in Ecology and Evolution* 16:602.

\* Undergraduate student co-author

(R6) **Arens, Nan Crystal**. 2001. Dry? Or not too dry? That is the question. *Trends in Ecology and Evolution* 16:484-485.

(R5) **Arens, Nan Crystal**. 2001. Oops they're doin' it again...The Permian-Triassic extinction. *Trends in Ecology and Evolution* 16:427-428

(R4) **Arens, Nan Crystal**. 2001. Climate and atmosphere interact to drive vegetation change. *Trends in Ecology and Evolution* 16:18.

(R3) **Arens, Nan Crystal**. 2000. Foreshadowing the Cretaceous-Tertiary extinction: None if by land, two if by sea. *Trends in Ecology and Evolution* 15:447.

(R2) **Arens, Nan Crystal**. 2000. Review of *Fossil Plants and Spores: Modern Techniques*, edited by T.P. Jones and N.P. Rowe. *Palaeontologica Electronica* vol. 3, issue 1 [[http://palaeo-electronica.org/2000\\_1/toc.htm](http://palaeo-electronica.org/2000_1/toc.htm)] [electronic journal].

(R1) Articles for *Encyclopaedia Britannica* on the following topics:

*Aneurophyton* [<http://www.britannica.com/EBchecked/topic/24385/Aneurophyton>].

*Archaeopteris* [<http://www.britannica.com/EBchecked/topic/32597/Archaeopteris>].

*Baragwanathia* [<http://www.britannica.com/EBchecked/topic/52553/Baragwanathia>].

*Calamites* [<http://www.britannica.com/EBchecked/topic/88767/Calamites>].

*Cordaites* [<http://www.britannica.com/EBchecked/topic/1450893/Cordaites>].

dawn redwood [<http://www.britannica.com/EBchecked/topic/660475/dawn-redwood>].

*Glossopteris* [<http://www.britannica.com/EBchecked/topic/235662/Glossopteris>].

*Hyenia* [<http://www.britannica.com/EBchecked/topic/279210/Hyenia>].

*Lepidodendron* [<http://www.britannica.com/EBchecked/topic/336789/Lepidodendron>].

*Pleuromeia* [<http://www.britannica.com/EBchecked/topic/464731/Pleuromeia>].

Rhynie plants [<http://www.britannica.com/EBchecked/topic/501880/Rhynie-plant>].

seed ferns [<http://www.britannica.com/EBchecked/topic/532431/seed-fern>].

*Sigillaria* [<http://www.britannica.com/EBchecked/topic/543581/Sigillaria>].

*Sphenophyllum* [<http://www.britannica.com/EBchecked/topic/559609/Sphenophyllum>].

### **Papers Presented at Professional Meetings**

(A58) Arens, N.C., W. Murray\*, H.E.L. Kerns\*, H. McGrath\*, W.R. Lewis\*, M.G. Meyer\*. 2023. It's all up in the air: Comparing microplastic deposition from precipitation and direct air fall in the Finger Lakes region of New York. *Geological Society of America Abstracts with Program* 55:

(A57) Kerns, H.E.L.\* and N.C. Arens. 2023. The Long and the Short of it: Can we distinguish microplastic sources in Seneca Lake using fiber length? *Geological Society of America Abstracts with Program* 55:

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