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# Caitlin Colleary

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## Education

PhD, Department of Geosciences Virginia Tech	November 2018
Visiting Research Fellow Smithsonian National Museum of Natural History (Dr. Behrensmeyer)	2017-2018
MSc, Palaeobiology University of Bristol	October 2013
BA (honors), Anthropology University of California, Los Angeles	June 2010

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## Current Position

Biomolecular Mass Spectrometry Postdoctoral Fellow Smithsonian National Museum of Natural History, Museum Conservation Institute	January 2019
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## Awards

Tilman Teaching Award, Advanced and Introductory Labs Virginia Tech, Department of Geosciences	Spring 2018
Winifred Goldring Award Association of Women Geoscientists	Spring 2017
Roundtable Dean's Scholarship, Finalist Virginia Tech, College of Science	Spring 2017
Nutshell Games (90 second talk), First place Virginia Tech, Center for Communicating Science	Spring 2017
Best Talk Award Geosciences Student Research Symposium, Virginia Tech	Spring 2016
Best Full Talk Award Progressive Palaeontology Conference, Bristol	Spring 2015
David Dineley Prize, Best MSc Thesis University of Bristol	January 2014
Poster Prize, Honourable Mention Palaeontological Association Annual Meeting, Zurich	Fall 2013

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## Grants and Fellowships

- External -

Instrument Time (40 hours) Pacific Northwest National Laboratory, Environmental Molecular Science Laboratory	Spring 2018
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Graduate STEM Research Fellowship Renewal NASA Virginia Space Grant Consortium	2017-2018 \$6000
Graduate STEM Research Fellowship NASA Virginia Space Grant Consortium	2016-2017 \$6000
Graduate Student Research Grant Geological Society of America	Spring 2016 \$1375
Stan Wood Award Palaeontological Association	Fall 2015 \$2100
Dr. Larry Agenbroad Legacy Fund for Research The Mammoth Site of Hot Springs, SD	Fall 2015 \$500
Travel Grant, Progressive Palaeontology Conference The Paleontological Society	Fall 2015 \$1000
- Internal -	
Doctoral Fellowship Virginia Tech Graduate School	Fall 2016 <i>Stipend</i>
Aubrey and Eula Orange Summer Scholarship Virginia Tech Department of Geosciences	Summer 2016 \$614
Graduate Research Development Fund Virginia Tech Graduate Student Assembly	Fall 2015 \$750
Charles J. Gose, Jr. Research Scholarship Virginia Tech Department of Geosciences	Summer 2015 \$1000

## Peer-reviewed Papers Published

3. A. Muscente, A. Czaja, L. Riedman, **C. Colleary**. 2017. Earth Science Series, Encyclopedia of Geochemistry: Organic Matter in Fossils. Springer.
2. T. Clements, **C. Colleary**, K. DeBaets, J. Vinther. 2016. Buoyancy mechanisms limit preservation of coleoid cephalopod soft tissues in Mesozoic Lagerstätten. *Palaeontology*. 60 (1), 1-14
1. **C. Colleary**, A. Dolocan, J. Gardner, S. Singh, M. Wuttke, R. Rabenstein, J. Habersetzer, S. Schaal, M. Feseha, M. Clements, B. Jacobs, L. Jacobs, R.L. Sylverstensen, S. Gabbot, J. Vinther. 2015. Chemical, experimental and morphological evidence for diagenetically altered melanin in exceptionally preserved fossils. *Proceedings of the National Academy of Sciences*. 112 (41), 12592-12597

## Peer-reviewed Papers Submitted

1. **C. Colleary**, H. Lamadrid, S.S. O'Reilly, A. Dolocan, S.J. Nesbitt. 2017. Correlating organic preservation, bone degradation and burial environments in mammoth fossils. *Scientific Reports*.

## Abstracts Talks

- 2017: **C. Colleary** et al. Biomolecule preservation in vertebrate fossils from different burial environments. Society of Vertebrate Paleontology Annual Meeting, Calgary

- 2017: **C. Colleary** et al. Similarly-aged mammoth fossils preserve organic material differently based on burial environment. Geoscience Student Research Symposium, Virginia Tech
- 2016: **C. Colleary**. Biomolecule degradation in terrestrial vertebrates in deep time. Geoscience Student Research Symposium, Virginia Tech (Best Talk Award)
- 2015: **C. Colleary** et al. Chemical and morphological evidence for diagenetically altered melanin in exceptionally preserved fossils. Progressive Palaeontology, Bristol (Best Full Talk Award)
- 2015: **C. Colleary**. The diagenetic alteration of biomolecules in deep time. Geoscience Student Research Symposium, Virginia Tech

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## Abstracts Posters

- 2018: **C. Colleary** et al. Chemically characterizing organic preservation in terrestrial vertebrates from the Late Triassic Hayden (~212 Ma) at Ghost Ranch, New Mexico. Society of Vertebrate Paleontology Annual Meeting, Albuquerque, NM
- 2016: **C. Colleary** et al. Chemically characterizing the diagenetic alteration of biomolecules in proboscideans. Society of Vertebrate Paleontology, Colbert Prize Poster Session
- 2014: **C. Colleary**, J. Vinther, A. Dolocan, J. Gardner. A statistical and mass spectrometric characterization of the molecular preservation of melanin. Society of Vertebrate Paleontology Annual Meeting, Berlin
- 2014: **C. Colleary**. The chemical characterization of melanin. Smithsonian Tropical Research Institute Fellows' Symposium
- 2013: **C. Colleary**, J. Vinther, A. Dolocan, J. Gardner. A statistical and mass spectrometric characterization of the molecular preservation of melanin. Palaeontology Association Annual Meeting, Zurich (Honourable Mention)
- 2013: T. Clements, **C. Colleary**, J. Vinther, K. DeBaets. Taphonomic and phylogenetic biased preservation of coleoid cephalopod muscle tissue in Lagerstätten formations. Palaeontology Association Annual Meeting, Zurich

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## Invited Talks

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| How to give a conference talk<br>Virginia Tech, Conference workshop                  | Spring 2018 |
| Science on Tap<br>Virginia Tech, Center for Communicating Science                    | Spring 2017 |
| What is molecular paleontology?<br>Virginia Tech, Research a la mode                 | Spring 2017 |
| Chemically characterizing melanin<br>Smithsonian Tropical Research Institute, Panama | Spring 2014 |

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## Popular Science Articles

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|---|---------------|
| Patterns in Palaeontology: Palaeoproteomics<br>PALAEONTOLOGY[online] Volume 7, Article 4, 1-6 | April 2017    |
| Research: Unlocking the Color of Fossils<br>myFOSSIL Volume 2, Issue 4                        | December 2015 |
| Fossils help to reveal the true colours of mammals for the first time<br>The Conversation     | October 2015  |

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## Formal Manuscript Reviews

Number of times as a reviewer in parentheses

- Journal of Vertebrate Paleontology (2)
  - Science (1)
  - PeerJ (2)
  - PNAS (1)
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## Internships

Smithsonian Tropical Research Institute, Panama <i>Paleontology Intern</i>	January – May 2014
The Mammoth Site of Hot Springs, South Dakota <i>Paleontology Intern</i>	Summer 2012
Natural History Museum of Los Angeles County <i>Dinosaur Institute Collections Intern</i>	January 2011 – August 2012
La Brea Tar Pits and Museum <i>Paleontology Preparation Laboratory Volunteer</i>	Summer 2008

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## Teaching and Work Experience

Virginia Tech, Department of Geosciences <i>Teaching Assistant</i>	Fall 2014 - Present
▪ GEOS1034: Earth's Natural Hazards	Spring 2018
▪ GEOS1024: Resources Geology	Spring 2018, Spring 2015
▪ GEOS1104: Physical Geology	Fall 2017, Spring 2016, Spring 2015, Fall 2015
▪ GEOS4234: Vertebrate Evolution	Spring 2016
The University of Bristol, Biology Department <i>Teaching Assistant</i>	Fall 2013
▪ Introductory Biology	
California Institute of Technology, Chemistry Department <i>Dr. James Heath's Assistant</i>	September 2010 – May 2012
Los Angeles Valley College, Anthropology Department <i>Teaching Assistant</i>	Fall 2008 – Spring 2009
▪ Biological Anthropology	
Los Angeles Valley College, Earth Sciences Department <i>Department tutor</i>	Fall 2007 – Spring 2008

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## Field and Laboratory Experience

### Field Experience

- Triassic archosaur excavations Summer 2015 and Summer 2017
  - Supervised 5 undergraduate and graduate students
    - Popo Agie Formation, Wyoming
    - Ghost Ranch, New Mexico

- Petrified Forest National Park, Arizona
- Ghost Ranch, New Mexico (Triassic) Summer 2014
- Panama Canal Excavation (Miocene) January – May 2014
- Morrison Formation, Utah (Jurassic) Summer 2011 and Summer 2012
- Mammoth sink hole, South Dakota (Pleistocene) Summer 2012
- UCLA Archaeology Field School, Botswana, Africa (Quaternary) Summer 2009

### Museum Collections Experience

- Virginia Tech Vertebrate Preparation Lab Fall 2014 – Present
  - Triassic fossil preparation, bone thin sections
- Bristol City Museum, United Kingdom Fall 2012 – Spring 2013
  - Pleistocene collection curation, databases, labeling
- Natural History Museum of Los Angeles County January 2011 – May 2012
  - Dinosaur collection curation, databases, labeling
- The Mammoth Site of Hot Springs, South Dakota Summer 2012
  - Created database, labeling, bone bed mapping in ARC-GIS
- The La Brea Tar Pits and Museum Summer 2008
  - Pleistocene collection preparation and curation

### Laboratory Experience

- Raman mass spectrometry, Virginia Tech
- Thermal maturation experiments, Virginia Tech
- Fossil bone thin sections, Virginia Tech
- Molecular biology lab, University of Bristol
- Controlled decay experiments of cephalopods and zebra finches, University of Bristol
- Scanning electron microscopy, University of Bristol
- Time-of-flight secondary ion mass spectrometry, University of Texas, Austin

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## Outreach and Service

- Science & Entertainment Exchange, National Academy of Sciences Fall 2017 – Present  
*Consultant*
- Palaeocast podcast Fall 2015 - Present  
*Associate producer*
- Women in (Geo)Sciences Fall 2014 – Fall 2018  
*Executive Board*
- Virginia Tech Geosciences Undergraduate Mentorship Program Fall 2015 – Fall 2018  
*Founder*
- Kindergarten STEM Investigations Program, Giles County Schools Spring 2016 – Fall 2018  
*Founder*
- Virginia Tech Women’s Alliance for Graduate Students Fall 2017 – Fall 2018  
*Member*
- Virginia Tech Graduate Student Assembly Fall 2017 – Spring 2018  
*Geosciences Delegate and Events Committee*

Conference talk judge <i>Virginia Tech Geosciences Student Research Symposium</i>	Spring 2018
Virginia Science Festival <i>Fossil Identification in Action</i>	November 2017
Department of Geosciences Undergrad Research Opportunities <i>Organizer</i>	September 2017
Virginia Tech Museum of Geosciences <i>Fossil Unwrapping Party</i>	August 2017
Virginia Tech Museum of Geosciences <i>World Premiere of New Fossils from Africa and China</i>	April 2017
Kindergarten 2 College <i>Vertebrate Paleontology lab tour</i>	April 2017
Geosciences Student Research Symposium <i>Organizer and Abstract Book Editor</i>	February 2016
Virginia Tech Museum of Geosciences <i>Fossil Unwrapping Party</i>	August 2016
Geosciences Student Research Symposium <i>Session moderator</i>	February 2015
Virginia Tech Institute for Creativity, Arts and Technology <i>Tech-or-Treat</i>	October 2015
Virginia Science Festival <i>Bringing Fossils Back to Life</i>	November 2014
Royal Society Summer Science Exhibition, London <i>Exhibitor</i>	Summer 2013
Synapse Magazine, University of Bristol <i>Editor</i>	Spring 2013
Bristol Dinosaur Project <i>Excavation leader</i>	Fall 2012
Natural History Museum of Los Angeles County <i>Haunted Museum</i>	October 2011
Aleph Journal for Undergraduate Research, UCLA <i>Editor</i>	Spring 2010

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## Media Experience

Selected articles:

- Roanoke Times "Understandable communication aim of first "Nutshell Games"
- Virginia Tech Magazine, Winter 2015-16 "Around the Drillfield"

- The Atlantic “How a Fossil Can Reveal the Color of a Dinosaur”
- Smithsonian “Researchers Devise Way to Determine Color from Fossils”
- The Guardian “Top fossils of 2016”
- The Christian Science Monitor “Color-coded fossils: Scientists can now find ancient creatures’ true colors”
- Science Daily “Pigment from fossils identified, revealing color of extinct animals”
- Daily Mail “Fossilized fur reveals color of 49-million-year-old bats”
- Newsweek “What Lies Beneath”

Films:

- *Dinosaur Hunters*, short film
- *Bringing Fossils Back to Life*, 3D film Virginia Tech Institute for Creativity, Arts and Technology

Interviews:

- Palaeocast interview: Episode 52 “Melanin”
- NHPR “Word of Mouth” interview
- Palaeocast episodes as interviewer: Dr. Larry Witmer (Episode 61), Dr. Ken Catania (Episode 73), Dr. Ted Daeschler (Episode 79), PalAss 2016, SVP 2016, GSA 2015, SVP 2015

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## Memberships

Association for Women Geoscientists, The Palaeontological Association, Society of Vertebrate Paleontology, Geological Society of America, Paleontological Society