

# Andrew Michael Zipkin, PhD, RPA - Curriculum Vitae

Arizona State University  
School of Human Evolution and Social Change  
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## EDUCATION

- 2015      **Doctor of Philosophy**, Hominid Paleobiology  
The George Washington University, Department of Anthropology, Washington, DC  
Dissertation: *Material Symbolism and Ochre Exploitation in Middle Stone Age East-Central Africa*  
Supervisor: Prof. Alison S. Brooks; Committee: Prof. John M. Hanchar and Prof. Peter W. Lucas
- 2013      **Master of Philosophy**, Hominid Paleobiology  
The George Washington University, Department of Anthropology, Washington, DC
- 2009      **Bachelor of Science**, Biology and Society, Magna Cum Laude with Research Honors  
Cornell University, Department of Science and Technology Studies, Ithaca, NY

## APPOINTMENTS

- 2022- Present      **Scientist**, Purity Survey, Materials Science  
Eurofins | EAG Laboratories, Liverpool, NY
- 2021- 2022      **Associate Scientist**, Purity Survey, Materials Science  
Eurofins | EAG Laboratories, Liverpool, NY
- 2021- Present      **Adjunct Professor**, School of Human Evolution and Social Change  
Arizona State University, Tempe, AZ
- 2020- 2021      **Assistant Research Scientist**, School of Human Evolution and Social Change  
Arizona State University, Tempe, AZ
- 2018- 2020      **Postdoctoral Research Associate**, School of Human Evolution and Social Change  
Arizona State University, Tempe, AZ
- 2015- 2018      **Postdoctoral Research Associate**, Department of Anthropology  
National Science Foundation SBE Interdisciplinary Postdoctoral Research Fellow (2015-2017)  
University of Illinois at Urbana-Champaign, Urbana, IL

## CURRENT ACADEMIC AND INDUSTRY PROJECTS

- 2024- Present      **Glow Discharge Mass Spectrometry for provenience analysis of ochre pigments using oxide-specific relative sensitivity factors**  
Directed by Gideon Bartov (Eurofins | EAG Laboratories) and Andrew Zipkin
- 2023- Present      **Compositional analysis of spodumene ores and concentrates by LA-ICP-MS and GDMS for purity verification and traceability in the lithium ion battery supply chain**  
Directed by Andrew Zipkin and Gideon Bartov (Eurofins | EAG Laboratories)

- 2018- Present **Isotopic provenience of ostrich eggshell beads to uncover social networks of the past in South Africa, Namibia, and Botswana**  
Directed by Pauline Wiessner (ASU), Andrew Zipkin, and John Kinahan (Namib Desert Archaeological Survey), in collaboration with Martin Hipondoka (University of Namibia), Petrus Le Roux (University of Cape Town), and Gaseitsiwe Masunga (Okavango Research Institute)

## PEER-REVIEWED PUBLICATIONS

- 2024 Alex Bertacchi, **Andrew M. Zipkin**, Julia Giblin, Gwyneth Gordon, Tyler Goepfert, Dan Asael, and Kelly J. Knudson. Trace element concentrations as proxies for diagenetic alteration in the African archaeofaunal record: Implications for isotope analysis. *Journal of Archaeological Science: Reports* (53): 104403.
- 2022 John K. Murray, Simen Oestmo, and **Andrew M. Zipkin**. Portable, non-destructive colorimetry and visible reflectance spectroscopy paired with machine learning can classify experimentally heat-treated silcrete from three South African sources. *PLOS ONE* 17 (4): e0266389.
- Rachel S. Popelka-Filcoff and **Andrew M. Zipkin**. The archaeometry of ochre *sensu lato*: A review. *Journal of Archaeological Science* 137: 105530.
- Mark Lipson, Elizabeth Sawchuk, Jessica Thompson, Jonas Oppenheimer, Christian Tryon, Kathryn Ranhorn, Kathryn de Luna, Kendra Sirak, Iñigo Olalde, Stanley Ambrose, John Arthur, Kathryn Arthur...**Andrew Zipkin**, Ron Pinhasi, Douglas Kennett, Fredrick Kyalo Manthi, Nadin Rohland, Nick Patterson, David Reich, and Mary Prendergast. Ancient DNA and deep population structure in sub-Saharan African foragers. *Nature* 603: 290–296.
- 2020 **Andrew M. Zipkin**, Gideon Bartov, Craig Lundstrom, Alex Taylor, Alyssa Dwyer, and Stanley Ambrose. Red earth, green glass, and compositional data: A new procedure for solid-state elemental characterization, source discrimination, and provenience analysis of ochres. *Journal of Archaeological Method and Theory* 27: 930-970.
- 2018 Andrew Du, **Andrew M. Zipkin**, Kevin G. Hatala, Elizabeth Renner, Jennifer L. Baker, Serena Bianchi, Kallista H. Bernal, and Bernard A. Wood. Tempo and mode of brain size evolution in the hominin clade. *Proceedings of the Royal Society B* 285: 20172738.
- Alison S. Brooks, John E. Yellen, Richard Potts, Anna K. Behrensmeyer, Alan L. Deino, David E. Leslie, Stanley H. Ambrose, Jeffrey R. Ferguson, Francesco d'Errico, **Andrew M. Zipkin**, Scott Whittaker, Jeffrey Post, Elizabeth G. Veatch, Kimberly Foecke, and Jennifer B. Clark. Long-distance stone transport and pigment use in the earliest Middle Stone Age. *Science* 360: 90-94.
- 2017 **Andrew M. Zipkin**, Stanley H. Ambrose, John M. Hanchar, Philip Piccoli, Alison S. Brooks, and Elizabeth Y. Anthony. Elemental fingerprinting of Kenya Rift Valley ochre deposits for provenance studies of rock art and archaeological pigments. *Quaternary International* 430: 42-59.
- 2015 **Andrew M. Zipkin**, John M. Hanchar, Alison S. Brooks, Mark W. Grabowski, Jessica C. Thompson, and Elizabeth Gomani-Chindebvu. Ochre fingerprints: Distinguishing among Malawian mineral pigment sources with Homogenized Ochre Chip LA-ICP-MS. *Archaeometry* 57 (2): 297-317.
- 2014 **Andrew M. Zipkin**, Mark Wagner, Kate McGrath, Alison S. Brooks, and Peter W. Lucas. An Experimental Study of Hafting Adhesives and the Implications for Compound Tool Technology. *PLOS ONE* 9 (11): e112560.

## GRANTS, SCHOLARSHIPS, AND FELLOWSHIPS

Total as PI, Co-PI, and Award Recipient: **\$629,711**; Total including all authored and co-authored: **\$800,365**

- 2020 **National Science Foundation Senior Archaeological Research Grant #BCS-2018010**: “Isotopic reconstruction of social networks in southern Africa: geochemistry, ethnoarchaeology, and recent prehistory”. PI: Pauline Wiessner, Co-PIs: Andrew Zipkin and John Kinahan; Duration: 2020-2023; \$189,272.
- 2019 **Wenner-Gren Foundation Post-Ph.D. Research Grant #9801**: “Isotopic provenience of ostrich eggshell beads to uncover social networks of the past”. PI: Andrew Zipkin; Duration: 2019-2020; \$20,000.
- 2017 **National Science Foundation Senior Archaeological Research Grant #BCS-1725123**: “Testing models of ancient forager social and territorial organization with a strontium isoscape”. PI: Stanley Ambrose, Senior Personnel: Andrew Zipkin; Duration: 2017-2019; \$170,654.
- 2016 **National Science Foundation Senior Archaeological Research Grant #BCS-1561176**: “Trace element analysis of ochre for modern and prehistoric pigment source use patterns”. PI: Andrew Zipkin, Co-PI: Stanley Ambrose; Duration: 2016-2017; \$45,241.
- Wenner-Gren Foundation Post-Ph.D. Research Grant #9305**: “The Ethno-Archaeometry of Ochre Source Exploitation Practices in Kenya”. PI: Andrew Zipkin; Duration: 2016-2017; \$16,210.
- 2015 **National Science Foundation SBE Postdoctoral Research Fellowship #SMA-1513984**: “Integrating geochemistry and ethnography to understand modern and ancient ochre use”. PI: Andrew Zipkin, Co-PIs: Stanley Ambrose, Craig Lundstrom; Duration: 2015-2017; \$221,500.
- 2012 **Wenner-Gren Foundation Dissertation Fieldwork Grant #8623**: “Material Symbolism and Ochre Use in Middle Stone Age East-Central Africa”. PI: Andrew Zipkin; Duration: 2012-2015; \$14,892.
- National Science Foundation Doctoral Dissertation Research Improvement Grant #BCS-1240694**: “Material Symbolism and Ochre Use in Middle Stone Age East-Central Africa”. PI: Alison S. Brooks, Co-PI: Andrew Zipkin; Duration: 2012-2015; \$25,196.
- 2011 **National Science Foundation Graduate Research Fellowship #2011116368**: “Ochre Exploitation in the Middle Stone Age of Central and East Africa”. PI: Andrew Zipkin, Duration: 2011-2014; \$90,000.
- The Explorers Club Washington Group Exploration and Field Research Grant**: “Ochre Exploitation in the MSA of northern Malawi”. PI: Andrew Zipkin; \$2,000.
- Cosmos Club Foundation Cosmos Scholars Grant**: “Identification and Characterization of Archaeologically Relevant Malawian Ochre Deposits”. PI: Andrew Zipkin; \$2,400.
- 2009 **William Warren Graduate Fellowship Award**, The George Washington University, \$500.
- Hirsch Scholarship for Travel to Archaeological Projects**, Cornell University, \$2,500.

## AWARDS

- 2014 **Martin Aitken Award for Best Student Poster**: “The Red and The Gray: Ochre Pigments and Iron Ores from Twin Rivers Kopje, Zambia”. Awarded at the International Symposium on Archaeometry, Los Angeles, CA.

- 2012 **R.E. Taylor Student Poster Award:** "On the formation and distribution of ochreous minerals in northern Malawi". Awarded by The Society for Archaeological Sciences at the 77<sup>th</sup> Annual Meeting of the Society for American Archaeology, Memphis, TN.

#### CONFERENCE PRESENTATIONS WITH PUBLISHED ABSTRACTS

- 2023 John Murray, Alicia Fritz, Bailey Goodling, Swanny Jurczak, Jacob Harris, and **Andrew Zipkin**. Revisiting the earliest evidence for silcrete heat treatment technology at Pinnacle Point 13Bm, South Africa using a new multi-proxy approach. "Abstracts of the 2023 Paleoanthropology Society Meeting", *PaleoAnthropology* 2023.
- 2022 Alex Bertacchi and **Andrew M. Zipkin**. Trace element concentrations as screening tools for detecting diagenesis in archaeological hard tissue. "Abstracts of the 2022 Paleoanthropology Society Meeting", *PaleoAnthropology* 2022.
- Alex Bertacchi, Stanley H. Ambrose, Julia I. Giblin, **Andrew M. Zipkin**, Jessica C. Thompson, and Potiphar Kaliba. Prehistoric socio-territoriality in Malawi: multi-isotopic perspectives on the behavioral ecology of Late Pleistocene foragers. *American Journal of Biological Anthropology* 177 (S73): 15.
- 2021 John Murray, Jayde Hirniak, and **Andrew M. Zipkin**. Impact of heat treatment on geochemistry of three silcrete source near Pinnacle Point, South Africa. *Geological Society of America Abstracts with Programs* 53(6): <https://doi.org/10.1130/abs/2021AM-371184>.
- 2020 **Andrew M. Zipkin**, Erich C. Fisher, Hayley C. Cawthra, Gwyneth Gordon, Martin Hipondoka, Petrus Le Roux, Curtis W. Marean, Kelly J. Knudson, and Polly Wiessner. Strontium isoscapes and hard tissue provenience in southern Africa to reconstruct hunter-gatherer social and exchange networks. *American Journal of Physical Anthropology* 171 (S69): 320.
- Stanley H. Ambrose and **Andrew M. Zipkin**. Ostrich eggshell diagenesis experiments and observations. *American Journal of Physical Anthropology* 171 (S69): 7.
- 2019 **Andrew M. Zipkin**, Erich C. Fisher, Hayley C. Cawthra, Gwyneth Gordon, and Kelly Knudson. Beyond the Swartberg: preliminary findings from an extended strontium isoscape in the South African Karoo. "Abstracts of the 2019 Paleoanthropology Society Meeting", *PaleoAnthropology* 2019: A30-A31.
- Cindy Hsin-yee Huang, John K. Murray, Claudine Gravel-Miguel, Micah Gumaru, and **Andrew M. Zipkin**. An experimental use-wear analysis of drilled gastropod operculum using 3D microscopy and its implications for Middle Stone Age symbolic behavior. "Abstracts of the 2019 Paleoanthropology Society Meeting", *PaleoAnthropology* 2019: A17-A18.
- 2018 **Andrew M. Zipkin**, Stanley H. Ambrose, Gideon Bartov, Zachary Benmamoun, Elizabeth Gomani-Chindebvu, and Jessica C. Thompson. Constructing Strontium Isoscapes to Test Models of Terminal Pleistocene and Early Holocene Forager Social and Territorial Organization in Northern Malawi. "Abstracts of the 2018 Paleoanthropology Society Meeting", *PaleoAnthropology* 2018: A40.
- 2017 **Andrew M. Zipkin**, Stanley H. Ambrose, Craig C. Lundstrom, Gideon Bartov, and Mercy Gakii. Construction of an Ochre Source Strontium Isoscape in the Kenya Rift Valley for Provenience Studies of Archaeological and Rock Art Mineral Pigments. "Abstracts of the Paleoanthropology Society 2017 Meeting", *PaleoAnthropology* 2017: A40-A41.

Stanley H. Ambrose, **Andrew M. Zipkin**, Mercy Gakii, David Coulson, and Matthew W. Magnani. Ethnography of Red Ochre Use by Pastoralists and Hunters in Kenya. "Abstracts of the Paleoanthropology Society 2017 Meeting", *PaleoAnthropology* 2017: A1.

Andrew Du, **Andrew M. Zipkin**, Kevin G. Hatala, Jennifer L. Baker, Serena Bianchi, Elizabeth Renner, Kallista H. Bernal, and Bernard Wood. A Taxonomic Scale-explicit Analysis of Brain Size Evolution in the Hominin Clade. *American Journal of Physical Anthropology* 162 (S64): 166.

- 2016 **Andrew M. Zipkin**, Alison S. Brooks, Nicholas P. Toth, and Kathy D. Schick. A reconsideration of the ochre artifact assemblage from J.D. Clark's excavation of Twin Rivers Kopje, Zambia. "Abstracts of the Paleoanthropology Society 2016 Meeting", *PaleoAnthropology* 2016: A30-A31.
- 2014 Andrew Du, **Andrew M. Zipkin**, Kevin G. Hatala, Jennifer L. Baker, Serena Bianchi, Elizabeth Renner, Kallista H. Bernal, and Bernard Wood. Quantifying the Tempo and Mode of Hominin Cranial Capacity Evolution Including Taking into Account Dating and Measurement Error. "Paleoanthropology Society Meeting Abstracts, Calgary, Canada, 8-9 April 2014", *PaleoAnthropology* 2014: A7.
- 2013 Jessica C. Thompson, **Andrew M. Zipkin**, Sheila Nightingale, David Wright, Jeong-Heon Choi, Alex Mackay, Menno Welling, and Elizabeth Gomani-Chindebvu. New Discoveries at Old Sites: The Legacy of J.D. Clark in Karonga, Malawi. "Paleoanthropology Society Meetings Abstracts, Honolulu, HI, 2-3 April 2013", *PaleoAnthropology* 2013: A36.
- 2012 **Andrew M. Zipkin**, Mark Wagner, and Alison S. Brooks. The effect of ochers on the material properties of resin hafting adhesives. "Abstracts of the Paleoanthropology Society 2012 Meeting", *PaleoAnthropology* 2012: A39.
- 2011 **Andrew M. Zipkin** and Alison S. Brooks. Experimental evaluation of ochre-containing mastic in the hafting of hunting armatures. "Abstracts of the Paleoanthropology Society 2011 Meeting", *PaleoAnthropology* 2011: A40-A41.
- 2010 **Andrew M. Zipkin**, Erin M. Williams, Alison S. Brooks, and Brian G. Richmond. Digging stick use and hand biomechanics. "Abstracts of the Paleoanthropology Society 2010 Meetings", *PaleoAnthropology* 2010: A39.

## SELECTED ADDITIONAL SCHOLARLY PRESENTATIONS

### Academic Conferences

- 2023 John Murray, Jacob Harris, **Andrew Zipkin**, Nicolas Hansen, and Bailey Goodling. Silcrete Heat Treatment Technology during the MIS 5/4 Transition at Pinnacle Point 5–6 and Vleesbaai, South Africa. 88th Annual Meeting of the Society for American Archaeology, Portland, OR
- 2022 **Andrew M. Zipkin**, Jayde N. Hirniak, and John K. Murray. Silcrete Geological Source Discrimination with Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry for Minimally Destructive Archaeological Stone Tool Provenience Studies. The Great Scientific Exchange (SciX) 2022, Covington, KY
- Jayde Hirniak, John Murray, and **Andrew Zipkin**. Developing an Empirical Calibration for Elemental Characterization and Sourcing of South African Silcrete with pXRF. 87<sup>th</sup> Annual Meeting of the Society for American Archaeology, Chicago, IL

John Murray, Jacob Harris, **Andrew Zipkin**, Simen Oestmo, and Curtis Marean. A New Multiproxy Approach to Distinguish Aboveground and Belowground Lithic Heat Treatment Methods. 87<sup>th</sup> Annual Meeting of the Society for American Archaeology, Chicago, IL

2021 Alex Bertacchi and **Andrew Zipkin**. Using concentrations of trace elements to detect diagenesis in archaeological hard tissues. The Great Scientific Exchange (SciX) 2021, Providence, RI

**Andrew M. Zipkin**, Martin Hipondoka, Petrus Le Roux, and Pauline Wiessner. Radiogenic strontium isoscape construction in the Kalahari and Namib deserts for provenience studies of ostrich eggshell ornaments. 9<sup>th</sup> Developing International Geoarchaeology Conference (Virtual)

**Andrew M. Zipkin** and John Murray. Visible reflectance spectroscopy paired with *k*-NN lazy learning for detection of heat treated silcrete. Australasian Research Cluster for Archaeological Science Conference (Virtual)

Stanley Ambrose and **Andrew Zipkin**. Implications of Ostrich Eggshell Diagenesis Experiments and Observations for Isoscape Analyses. 86<sup>th</sup> Annual Meeting of the Society for American Archaeology (Virtual)

John Murray, Scott Keohane, and **Andrew Zipkin**. Experimental Identification of Heat-Treated Silcrete Using Colorimetry and Reflectance Spectrophotometry. 86<sup>th</sup> Annual Meeting of the Society for American Archaeology (Virtual)

2019 **Andrew M. Zipkin**, Erich Fisher, Gwyneth Gordon, Hayley Cawthra, Kelly Knudson, and Curtis Marean. From Coast to Karoo: A Radiogenic Bioavailable Strontium Isoscape in South Africa for Provenience Studies. The Great Scientific Exchange (SciX) 2019, Palm Springs, CA

Alex Bertacchi, Jessica Thompson, Stanley Ambrose, **Andrew Zipkin**, and Elizabeth Gomani-Chindebvu. Late Pleistocene Archaeofauna from the Kasitu Valley of Northern Malawi: Palaeoenvironments and Evolution of Faunal Communities in the Zambezian Ecozone. 84<sup>th</sup> Annual Meeting of the Society for American Archaeology, Albuquerque, NM

Brady Kelsey, Steve Brandt, **Andrew Zipkin**, and Evan Wilson. Provenance of ochre at Mochena Borago Rockshelter, SW Ethiopia: an interdisciplinary approach. East African Association for Palaeoanthropology and Palaeontology (EAAPP): Seventh Biennial Conference, Nairobi, Kenya

2018 **Andrew Zipkin**, Stanley Ambrose, Gideon Bartov, Alexander Taylor, and Mercy Gakii. Ethno-archaeometry of Ochre Mineral Pigment Extraction, Transport, and Use in the Kenya Rift Valley. 83<sup>rd</sup> Annual Meeting of the Society for American Archaeology, Washington, DC

**Andrew M. Zipkin**, Alexander Taylor, Alyssa Dwyer, Gideon Bartov, Stanley H. Ambrose, and Craig C. Lundstrom. Red Rock and Black Glass: Geochemical Methods and Provenance Case Studies of Ochres from the Kenya Rift Valley. 5<sup>th</sup> Science and Archaeology Symposium of the Illinois State Archaeological Survey, Urbana, IL

Zachary Benmamoun, **Andrew Zipkin**, Gideon Bartov, and Stanley Ambrose. What is the best method to measure bioavailable strontium isotope ratios for archaeological provenance? 5<sup>th</sup> Science and Archaeology Symposium of the Illinois State Archaeological Survey, Urbana, IL

Stanley Ambrose, **Andrew Zipkin**, Douglas Kennett, Abigail Fisher, and Jessica Thompson. Dietary and Environmental Reconstruction with Stable Isotopes of Early, Middle and Late Holocene Humans from Malawi. 83<sup>rd</sup> Annual Meeting of the Society for American Archaeology, Washington, DC

Jessica Thompson, **Andrew Zipkin**, David Wright, Stanley Ambrose, and Flora Schilt. Out with a Whimper or a Bang? Hunter-Gatherer Response to the End of the African Humid Period in Northern Malawi. 83<sup>rd</sup> Annual Meeting of the Society for American Archaeology, Washington, DC

2017 **Andrew Zipkin**, Craig Lundstrom, Stanley Ambrose, Gideon Bartov, Alyssa Dwyer, Alex Taylor, and Mercy Gakii. The Kenya Red Ochre Chemistry (KROC) Database: Integrating geochemistry and ethnography for a new approach to archaeometric provenience studies. The Great Scientific Exchange (SciX) 2017, Reno, NV

2016 **Andrew M. Zipkin**, Stanley H. Ambrose, Craig C. Lundstrom, Mercy Gakii, and Matthew W. Magnani. The Ethno-Archaeometry of Modern Ochre Use in Kenya. Raw materials exploitation in prehistory: sourcing, processing and distribution meeting, Faro, Portugal

Alison Brooks, John Yellen, **Andrew Zipkin**, Laure Dussubieux, and Rick Potts. Early Worked Ochre in the Middle Pleistocene at Olorgesailie, Kenya. 81<sup>st</sup> Annual Meeting of the Society for American Archaeology, Orlando, FL

Stanley Ambrose, **Andrew Zipkin**, Mercy Gakii and Craig Lundstrom. Ethnography and Archaeometry of Red Ochre Use by the Maasai and Samburu in Kenya. 81<sup>st</sup> Annual Meeting of the Society for American Archaeology, Orlando, FL

2015 **Andrew M. Zipkin**, Alison S. Brooks, John M. Hanchar, Kathy Schick, and Nicholas Toth. The Preferential Collection and Use of Ochre Pigments and Iron Ores at Twin Rivers Kopje, Zambia. 80<sup>th</sup> Annual Meeting of the Society for American Archaeology, San Francisco, CA

**Andrew M. Zipkin**, Alison S. Brooks, John Hanchar, Kathy Schick, and Nicholas Toth. Ochre Pigment and Iron Ore Provenance at the Middle Stone Age Site of Twin Rivers Kopje, Zambia. 14<sup>th</sup> Congress of the Pan-African Archaeological Association for Prehistory and Related Studies and the 22<sup>nd</sup> Biennial Meeting of the Society of Africanist Archaeologists, Johannesburg, South Africa

2014 **Andrew M. Zipkin**, Alison S. Brooks, Jan Kosler, John M. Hanchar, Kathy D. Schick, and Nicholas P. Toth. The Red and The Gray: Ochre Pigments and Iron Ores from Twin Rivers Kopje, Zambia. International Symposium on Archaeometry, Los Angeles, CA

2013 **Andrew M. Zipkin**, John M. Hanchar, Jessica C. Thompson, Alison S. Brooks, Nicholas P. Toth, Kathy D. Schick, and Elizabeth Gomani-Chindebvu. The trace element geochemistry of archaeological ochres from Chaminade Hill, Karonga, Malawi. East African Association for Paleoanthropology and Paleontology (EAAPP): Fourth Biennial Conference, Mombasa, Kenya

**Andrew M. Zipkin**, Mark Wagner, and Alison S. Brooks. The Role of Loading Agent Particle Size and Mineralogy in Formulating Compound Hafting Adhesives. 78<sup>th</sup> Annual Meeting of the Society for American Archaeology, Honolulu, HI

2012 **Andrew M. Zipkin**, Alison S. Brooks, John M. Hanchar, Jessica C. Thompson, and Elizabeth Gomani-Chindebvu. On the formation and distribution of ochreous minerals in northern Malawi. 77<sup>th</sup> Annual Meeting of the Society for American Archaeology, Memphis, TN

### Invited University Lectures

2021 “Bioavailable strontium isoscapes for investigating ancient forager exchange networks in Namibia”  
Department of Geological Sciences, University of Texas at El Paso

- 2020 “Strontium isoscape construction in southern Africa to uncover social networks of the past”  
Institute of Human Origins, Arizona State University, Tempe, AZ
- 2018 “Strontium isotope provenience studies of the Pleistocene through present”  
Center for the Advanced Study of Human Paleobiology, The George Washington University,  
Washington, DC
- 2017 “Ethnography, Archaeology, and Archaeometry of Red Ochre Use in Eastern Africa”  
Department of Anthropology, University of Illinois at Urbana-Champaign, Urbana, IL
- 2012 “Material symbolism and ochre exploitation in Middle Stone Age East-Central Africa”  
Department of Earth Sciences, Memorial University of Newfoundland, St. John’s, Canada

## SYMPOSIUM AND CONFERENCE ORGANIZATION

- 2024 **Symposium Chair** for “LA-ICP-MS Applications in Art & Archaeology” at The Great Scientific Exchange 2024, Raleigh, NC
- 2021 **Section Chair** for “Art & Archaeology” at The Great Scientific Exchange 2021. Composed of two invited speaker symposiums. Providence, RI
- 2020 **Section Chair** for “Art & Archaeology” at The Great Scientific Exchange 2020. Composed of two streaming webinars and three asynchronous symposiums. (Virtual)
- Symposium Co-chair** with Jayde Hirniak for “Topics in Art/Archaeology/Forensics 2: Archaeological Chemistry” at The Great Scientific Exchange 2020 (Virtual)
- Symposium Co-chair** with Beth Scaffidi for “Isoscapes, Isotopic Provenience, and Baseline Studies in Human Ecologies: Methodological and Interpretive Challenges” at the 89th Annual Meeting of the American Association of Physical Anthropologists, Los Angeles, CA (Conference canceled)
- 2019 **Symposium Co-chair** with Mary Kate Donais for “Chemistry in Art and Archaeology Sponsored by the Society for Archaeological Sciences” at The Great Scientific Exchange 2019, Palm Springs, CA
- Symposium Co-chair** with David Leslie for “Archaeological science outside the ivory tower: Perspectives from CRM” at the 84<sup>th</sup> Annual Meeting of the Society for American Archaeology, Albuquerque, NM
- 2018 **Symposium Co-chair** with Mary Kate Donais for “Chemistry in Art and Archaeology Sponsored by the Society for Archaeological Sciences” at The Great Scientific Exchange 2018, Atlanta, GA
- 2016 **Symposium Co-chair** with Joelle Nivens and James McGrath for “Towards a global understanding of ochre use” at the 81<sup>st</sup> Annual Meeting of the Society for American Archaeology, Orlando, FL

## FIELD EXPERIENCE

- 2019 **Principal Investigator: Namibia** – “Isotopic provenience of ostrich eggshell beads to uncover social networks of the past”; plant and shell collection and mapping in the Kalahari and Namib Deserts. Arizona State University and University of Namibia



- 2018 **Strontium isoscape survey leader:** “South African Coast Paleoclimate, Paleoenvironment, Paleocology, Paleoanthropology” project; plant sample collection and mapping in the Karoo. Arizona State University
- 2017 **Strontium isoscape survey leader:** “Malawi Ancient Lifeways And Peoples Project”; plant, soil, and mollusk shell collection and mapping in Mzimba and Nkhata Bay districts. University of Illinois at Urbana-Champaign and Emory University
- 2016 **Archaeological pigment specialist:** “Malawi Ancient Lifeways And Peoples Project” Emory University and Malawi Department of Antiquities
- 2015 **Principal Investigator:** Kenya Rift Valley – “Integrating geochemistry and ethnography to understand modern and ancient ochre use”; led an international team for geological and ethnographic survey. University of Illinois at Urbana-Champaign and Nairobi National Museum
- 2014 **Archaeological pigment specialist:** “Malawi Earlier-Middle Stone Age Project” University of Queensland and Malawi Department of Antiquities
- 2013 **Principal Investigator:** Zambia – Dissertation research; ochre source survey near Twin Rivers Kopje. The George Washington University
- 2012 **Principal Investigator:** Kenya Rift Valley – Dissertation research; ochre source survey. The George Washington University and Nairobi National Museum
- 2011 & 2012 **Archaeological pigment specialist:** “Malawi Earlier-Middle Stone Age Project” University of Queensland and Malawi Department of Antiquities
- 2009 & 2010 **Student Researcher:** Kenya – “Olorgesailie Project – Middle Stone Age Group” The George Washington University and Nairobi National Museum
- 2008 **Project Staff:** Alaska, USA – “Nuvuk Archaeological Project” Ukpeaġvik Iñupiat Corporation Science
- 2007 **Student:** South Africa – “Palaeo-Archaeological Field School at Swartkrans and Kudu Koppie” University of the Witwatersrand

## SELECTED LABORATORY AND MUSEUM EXPERIENCE

- 2021-2024 **Associate Scientist & Scientist:** Gained proficiency in routine elemental analysis of alloys, glasses, rare earth oxides, precious metals, polymers, semiconductors and extractable/leachable using ICP-MS. Develop and validate new methods for single and triple quadrupole ICP-MS with a ThermoScientific iCAP TQ. Served as subject matter expert for Laser Ablation ICP-MS, including writing technique and application notes and presenting internal and client-facing webinars. Purity Survey, Materials Science, Eurofins | EAG Laboratories
- 2018-2021 **Principal Investigator:** Measured  $^{87}\text{Sr}/^{86}\text{Sr}$  in plants, soil, and avian eggshell using Multiple Collector-Inductively Coupled Plasma-Mass Spectrometry (MC-ICP-MS), developed methods for diagenesis detection and *in situ* analysis of shell by laser ablation, managed laboratory assistants, and trained collaborating geochemists in laser ablation best practices. Metals, Environmental, and Terrestrial Analytical Laboratory, Arizona State University

- 2017-2018 **Postdoctoral Researcher:** Measured  $87\text{Sr}/86\text{Sr}$  in plants and mollusk shells using MC-ICP-MS, trained and supervised two laboratory assistants, and conducted geostatistical analysis. Departments of Anthropology and Geology, University of Illinois at Urbana-Champaign
- 2015-2017 **Principal Investigator:** Strontium isotope ratio and trace element characterization of Kenya Rift Valley ochre sources and pigment artifacts using Laser Ablation (LA)-ICP-MS and MC-ICP-MS. Department of Geology, University of Illinois at Urbana-Champaign
- 2014 **Visiting Researcher:** Provenance geochemistry of ochre artifacts from Olorgesailie, Kenya using LA-ICP-MS for the Olorgesailie Project – Middle Stone Age Group. Integrative Research Center, The Field Museum of Natural History
- Visiting Researcher:** Trace element characterization of Zambian ochre sources and provenance analysis of Twin Rivers Kopje, Zambia site ochre artifacts using LA-ICP-MS. Center for Element and Isotope Analysis, University of Bergen
- Visiting Researcher:** Trace element analysis of ochre from Kenya and Malawi by LA-ICP-MS. Department of Earth Sciences, Memorial University of Newfoundland
- 2012-2013 **Visiting Researcher:** Artifact photography, raw material identification, use-wear analysis, and colorimetry/spectrophotometry for the Chaminade 1A, Malawi and Twin Rivers Kopje, Zambia collections. The Stone Age Institute and Indiana University
- 2012 **Visiting Researcher:** Trace element analysis of Malawi ochres by LA-ICP-MS, refinement of homogenized ochre chip sample preparation, analysis of zircon crystals by cathodoluminescence. Department of Earth Sciences, Memorial University of Newfoundland
- 2011-2013 **Principal Investigator:** Experimental formulation of plant resin-based glues, construction of hafted composite tool proxies, and adhesive fracture energy testing to quantify the effect of ochre additives on adhesive durability. Department of Mechanical and Aerospace Engineering and Department of Anthropology, GWU
- 2011 **Student:** Classroom and experimental archaeology training in prehistoric lithic technology. Centre National de la Recherche Scientifique (Les Eyzies de Tayac, France)
- 2010 **Visiting Researcher:** Elemental analysis with X-Ray Fluorescence and Neutron Activation Analysis. Archaeometry Laboratory, University of Missouri Research Reactor
- 2007-2008 **Fossil Conservator:** Prepared dinosaur and fish fossils and led lab demonstrations for visitors. Museum of the Earth/Paleontological Research Institute

## TEACHING AND MENTORSHIP EXPERIENCE

- 2022 **Featured Speaker:** Delivered a live public webinar on LA-ICP-MS technology and applications for the EAG SMART Chart webinar series and answered questions from industry and academic attendees. Purity Survey, Materials Science, Eurofins | EAG Laboratories
- 2019 **Part-time Instructional Professional:** Lectured on ochre archaeometry as part of the series “Ancient lives under the microscope” in spring 2019, and about provenance/object biography in fall 2019. Osher Lifelong Learning Institute, Arizona State University

- 2018-2021 **Mentored** two graduate students: John Murray: UV-Vis-NIR reflectance spectroscopy; Jayde Hirniak: Compositional data and chemometrics; Both: In-house reference material development for XRF. School of Human Evolution and Social Change, Arizona State University
- 2018-2020 **Trained and supervised student research apprentices** in sample preparation for strontium isotope analysis: Madeline Maiorella, Benjamin Walker, Emily Brennan, Scott Collins, and Nic Hansen. Archaeological Chemistry Laboratory, Arizona State University
- 2018 **Guest Lecturer:** Understanding Archaeology  
Lectured on theory and history of provenance studies, and introduced applicable instrumental methods. School of Human Evolution and Social Change, Arizona State University, Taught by Curtis Marean
- 2016-2018 **Trained and supervised student laboratory assistants** in ochre, plant, and shell preparation for strontium isotope and trace element analysis, and mentored original research leading to presentations and co-authored publications: Alyssa Dwyer, Zachary Benmamoun, and Alex Taylor. Departments of Anthropology and Geology, University of Illinois at Urbana-Champaign
- 2016 **Guest Lecturer:** Archaeometry and African Archaeology (2 courses)  
Lectured on provenance studies, mass spectrometry, and African Middle Stone Age technology. Department of Anthropology, University of Illinois at Urbana-Champaign, Taught by Stanley Ambrose
- 2012-2013 **Trained a junior graduate student** (Kate McGrath) in measuring adhesive fracture energy for experimental hafted tools, leading to a co-authored publication (Zipkin *et al.*, 2014). Department of Mechanical and Aerospace Engineering, The George Washington University
- Graduate Teaching Assistant and Guest Lecturer:** Introduction to Archaeology (1 semester) ~100 undergraduate anthropology major and non-major students enrolled. Department of Anthropology, The George Washington University, Taught by Susan Johnston
- 2011-2012 **Supervised Australian and Malawian field school students** on surveys and excavations and taught a module on archival research for field archaeology (two one-month field seasons). Malawi Earlier-Middle Stone Age Project, Directed by Jessica Thompson
- 2010 **Graduate Teaching Assistant:** Human Cultural Beginnings (1 semester)  
Writing intensive course for 10 advanced undergraduates, edited and graded student papers. Department of Anthropology, The George Washington University, Taught by Alison Brooks
- Graduate Teaching Assistant:** Introduction to Biological Anthropology (1 semester)  
Led a twice weekly laboratory section and office hours, 20 undergraduate students per section. Department of Anthropology, The George Washington University, Taught by Alison Brooks
- 2009 **Graduate Teaching Assistant:** Introduction to Biological Anthropology (1 semester)  
Led a twice weekly laboratory section and office hours, 20 undergraduate students per section. Department of Anthropology, The George Washington University, Taught by Shannon McFarlin
- 2008 **Undergraduate Teaching Assistant:** Human Biology and Evolution (1 semester)  
Led a twice weekly discussion section for 25 students, developed and graded exam questions. Division of Nutritional Sciences, Cornell University, Taught by Jere Haas
- Field School Staff:** Instructed Nuvuk Archaeological Project field school students in systematic test pitting, human skeletal feature excavation, sieving, flotation, and artifact cataloging. Ukepaġvik Iñupiat Corporation Science, Supervised by Anne Jensen

## LEADERSHIP, SERVICE, AND OUTREACH

- 2024 **Co-Guest Editor** of the joint Journal of Archaeological Science/JAS: Reports special issue “Worldwide Archaeological Science of Ochre: New Results and Challenges”, with Rachel Popelka-Filcoff, Marcela Sepúlveda, and Hélène Salomon.
- 2023-  
Present **President Elect** for The Society for Archaeological Sciences: Recruited a new Vice President for Intersociety Relations and transitioned my former duties to her over a 6-month mentoring period. Developed a Statement of Values for the society with the serving President. Laid the groundwork for establishing a Golden Anniversary fund to solicit donations from longtime SAS members in support of a celebration commemorating the 1977 founding of SAS.
- 2023 **Featured Speaker** for the opening of the exhibit “Pigment of Imagination” at the Hood Museum of Art, Dartmouth University, a student-developed exhibit focused on the use of ochre by artists from Africa, Australia, Oceania, and North and South America.
- 2021 **Guest Editor** for a manuscript published in the Proceedings of the National Academy of Sciences of the United States of America, invited by the Editorial Board (doi.org/10.1073/pnas.2021495118).
- 2020-  
2023 **Vice President for Intersociety Relations** for The Society for Archaeological Sciences (SAS): Identified and engaged potential partner organizations that could add value for SAS members through joint programming and reciprocal benefits, developed event co-sponsorship agreements and conducted post-event evaluations of effectiveness, created and managed the Inter-organization Delegate program. The annual number of SAS co-sponsored conferences tripled under my tenure and included events in South America and Oceania for the first time.
- 2019-  
Present **Delegate to the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Governing Board** from The Society for Archaeological Sciences: Led the application process to join FACSS and represent the interests of SAS on the governing board and annual conference committee.
- 2017 **National Science Foundation *ad hoc* reviewer** for Archaeology and Archaeometry grant proposals, subject matter expert for ochre provenance and strontium isoscapes.
- 2016-  
2020 **Vice President for Social Media and Outreach** for The Society for Archaeological Sciences: Managed multi-platform social media presence, wrote original content, conducted online membership satisfaction surveys, organized conference symposia, and raised funds from industry partners.
- 2016 **Featured speaker** for the intergenerational programming series at the Circle of Friends Adult Day Center, Champaign, IL. Presentation: “Intersections in African Archaeology”.
- 2014 **External reviewer** for University of Missouri Archaeometry Laboratory Grant Proposals.
- 2012-  
2014 **Featured speaker** for “The Scientist Is In” and “Human Origins Today”, public programs of the National Museum of Natural History, Smithsonian Institution, Washington, DC (five times).
- 2012 **Organizer** of “Archaeology Day 2012”, an outreach event for the Karonga, Malawi community sponsored by the Malawi-Earlier Middle Stone Age Project and Cultural and Museum Center Karonga.
- 2012-  
2015 **Web manager and blogger** for the Malawi Earlier-Middle Stone Age Project site (memsap.org): Responsible for development and maintenance of site, and coordination of contributing bloggers.
- Ongoing ***Ad hoc* peer reviewer**: verified review record at [www.webofscience.com/wos/author/record/745190](http://www.webofscience.com/wos/author/record/745190)

## INTERVIEWS, COMMENTARY, AND MEDIA COVERAGE

- 2022 “Old Stone Age culture discovered in China” by Nicoletta Lanese, Live Science, Online 2 March 2022. [www.livescience.com/old-stone-age-site-discovered-china](http://www.livescience.com/old-stone-age-site-discovered-china)
- “Africa’s Oldest DNA Is Helping Address Science’s Racial Bias” by Matt Reynolds, Wired, Online 23 February 2022. [www.wired.com/story/ancient-african-dna/](http://www.wired.com/story/ancient-african-dna/)
- 2021 “Simple campfire chemistry hints how ancient humans produced pigments” by James Urquhart, Chemistry World, Online 8 December 2021. [www.chemistryworld.com/news/simple-campfire-chemistry-hints-how-ancient-humans-produced-pigments/4014845.article](http://www.chemistryworld.com/news/simple-campfire-chemistry-hints-how-ancient-humans-produced-pigments/4014845.article)
- 2019 “The Real Dragonglass: Not Just the Stuff of Fantasy, Obsidian Chronicles Our Deep Past” by Gemma Tarlach, Discover Magazine, June 2019 – online as “The Real Story Behind Game of Thrones’ Dragonglass,” Discover Blogs, 12 April 2019. [www.discovermagazine.com/planet-earth/the-real-story-behind-game-of-thrones-dronglass](http://www.discovermagazine.com/planet-earth/the-real-story-behind-game-of-thrones-dronglass)
- “El vidriagon no es un invento de juego de tronos”, by Esther Sánchez, Quo. Online 22 April 2019. [www.quo.es/ciencia/a27223694/el-vidriagon-no-es-un-invento-de-juego-de-tronos/](http://www.quo.es/ciencia/a27223694/el-vidriagon-no-es-un-invento-de-juego-de-tronos/)
- 2018 “Pigment of our Imagination” by Gemma Tarlach, Discover Magazine, April 2018 – online as “What the Ancient Pigment Ochre Tells Us About the Human Mind”, Discover Blogs. [www.discovermagazine.com/planet-earth/prehistoric-use-of-ochre-can-tell-us-about-the-evolution-of-humans](http://www.discovermagazine.com/planet-earth/prehistoric-use-of-ochre-can-tell-us-about-the-evolution-of-humans)
- “Brain size of human ancestors evolved gradually over 3 million years”, EurekAlert!, 20 February 2018. [www.eurekalert.org/pub\\_releases/2018-02/uocm-bso022018.php](http://www.eurekalert.org/pub_releases/2018-02/uocm-bso022018.php)
- 2011 “In African Cave, An Early Human Paint Shop” by Chris Joyce, National Public Radio’s *Morning Edition*. Originally aired 14 October 2011. [www.npr.org/2011/10/14/141313283/in-african-cave-an-early-human-paint-shop](http://www.npr.org/2011/10/14/141313283/in-african-cave-an-early-human-paint-shop)

## PROFESSIONAL ORGANIZATIONS

American Chemical Society  
Technical Division: Analytical Chemistry

Register of Professional Archaeologists: RPA #44588378

The Society for Archaeological Sciences: Lifetime member

## RECENT CONTINUING EDUCATION

- 2023 North American Workshop on Laser Ablation (NAWLA): June 5<sup>th</sup> – 9<sup>th</sup>, University of Notre Dame
- OSHA Hazardous Waste Operations and Emergency Response (HazWOpER) Annual Refresher: 8 hours online, 360training.com
- 2022 Thermo Scientific iCAP PRO ICP-OES Learning Plan: Self-paced eLearning Program
- OSHA Hazardous Waste Operations and Emergency Response (HazWOpER) Annual Refresher: 8 hours online, 360training.com

- Heartsaver First Aid CPR AED Program: 8 hours in-person, American Heart Association
- 2021 Manager of Environmental Safety and Health Programs (MESH-AZ): 100 hour continuing education certification jointly awarded by the OSHA Education Center at Arizona State University, the Arizona Chapter of the National Safety Council, and the Arizona Division of Occupational Safety and Health.
- OSHA Hazardous Waste Operations and Emergency Response (HazWOpER): 40 hours in-person, OSHA Education Center at Arizona State University
- 2020 OSHA 511: Occupational Safety and Health Standards for General Industry: 30 hours live online, OSHA Education Center at Arizona State University
- Adult First Aid, CPR, and AED: 8 hours in-person, Arizona Chapter National Safety Council
- Bioavailability of Contaminants in Soil: Considerations for Human Health Risk Assessment: 2.25 hours live online, Interstate Technology and Regulatory Council
- Introduction to Molecular Spectroscopy: 9 hours online, University of Manchester, offered through Coursera (Certificate: [coursera.org/account/accomplishments/verify/UKMXFKVXWQW5](https://coursera.org/account/accomplishments/verify/UKMXFKVXWQW5))
- 2019 Practical Instructional Design: 8 hours online, Arizona State University Continuing and Professional Education