

Ellery Frahm

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Yale University, Anthropology Department
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CURRENT POSITIONS

Faculty Research Scientist & Lecturer, Anthropology Department, Yale University — 2017-Present
Director, Yale Initiative for the Study of Ancient Pyrotechnology & Yale Archaeological XRF ExoLab,
Council on Archaeological Studies, Yale University — 2017-Present
Curatorial Affiliate, Anthropology Division, Peabody Museum of Natural History — 2018-Present

EDUCATION

Ph.D., Anthropology, University of Minnesota, advisor: Gilbert Tostevin — 2010
Best Dissertation Award in the Social and Behavioral Sciences and Education (2010-2012),
University of Minnesota Graduate School — 2012
M.S., Interdisciplinary Archaeological Studies, University of Minnesota — 2002
B.A., Grinnell College, Grinnell, Iowa — 1999

PAST POSITIONS

Senior Research Associate, Anthropology Department, University of Minnesota — 2017-2018
Visiting Assistant Professor, Anthropology Department, University of Minnesota — 2016
Courses: *Introduction to Archaeology* and *Analysis of Stone Tool Technology*
Research Fellow, Anthropology Department, Harvard University — 2015-2016
Postdoctoral Associate, Anthropology & Earth Sciences, University of Minnesota — 2014-2016
Visiting Researcher, Role of Culture in Early Expansions of Humans, Tübingen University — 2014
Marie Curie Research Fellow, Archaeology Department, University of Sheffield — 2012-2014
Two-year postdoctoral fellowship with the transnational Marie Curie network *New Archaeological Research Network for Integrating Approaches to Ancient Material Studies* (NARNIA)
Graduate Faculty, Anthropology Department, University of Minnesota — 2011-2013
Term appointment to co-advise a graduate student on her Master's research project
Lecturer, Anthropology Department, University of Minnesota — 2011
Courses: *Anthropology of the Modern Middle East* and *Geoarchaeology*
Research Associate/Fellow, Earth Sciences Department, University of Minnesota — 2003-2011
Served as Manager and Principal Analyst of a state-of-the-art X-ray spectrometry laboratory;
hired as a half-time *Research Assistant* in 2001 and promoted to a full-time *Lab Manager* and
Research Fellow in 2003, to *Senior Research Fellow* in 2008, and to *Research Associate* in 2010

PUBLICATIONS

Peer-Reviewed Journal Articles

Frahm, E., Tryon, C.A. 2018. Origins of Epipalaeolithic obsidian artifacts from Garrod's excavations at Zarzi cave in the Zagros foothills of Iraq. Accepted, *Journal of Archaeological Science: Reports*.
Frahm, E. 2018. Ceramic studies using portable XRF: From experimental tempered ceramics to imports and imitations at Tell Mozan, Syria. *Journal of Archaeological Science* 90:12-38.

August 2018

- Frahm, E.**, Tryon, C.A. 2018. Later Stone Age toolstone acquisition in the Central Rift Valley of Kenya: Portable XRF of Eburran obsidian artifacts from Leakey's excavations at Gamble's Cave II. *Journal of Archaeological Science: Reports* 18:475-486.
- Monnier, G., **Frahm, E.**, Luo, B., Missal, K. 2018. Developing FTIR microspectroscopy for analysis of animal-tissue residues on stone tools. *Journal of Archaeological Method and Theory* 25:1-44.
- Kandel, A.W., Gasparyan, B., Allué, E., Bigga, G., Bruch, A., Cullen, V.L., **Frahm, E.**, Ghukasyan, R., Gruwier, B., Jabbour, F., Miller, C.E., Taller, A., Vardazaryan, V., Vasilyan, D., Weissbrod, L. 2017. The earliest evidence for Upper Paleolithic occupation in the Armenian Highlands at Aghitu-3 Cave. *Journal of Human Evolution* 110:37-68.
- Frahm, E.**, Sherriff, J., Wilkinson, K.N., Beverly, E.J., Adler, D.S., Gasparyan, B. 2017. Ptghni: A new obsidian source in the Hrazdan River Basin, Armenia. *Journal of Archaeological Science: Reports* 14:55-64.
- Frahm, E.**, Hauck, T.C. 2017. Origin of an obsidian scraper at Yabroud Rockshelter II (Syria): Implications for Near Eastern social networks in the early Upper Palaeolithic. *Journal of Archaeological Science: Reports* 13:415-427.
- Frahm, E.**, Goldstein, S.T., Tryon, C.A. 2017. Late Holocene forager-fisher and pastoralist interactions along the Lake Victoria shores, Kenya: Perspectives from portable XRF of obsidian artifacts. *Journal of Archaeological Science: Reports* 11:717-742.
- Monnier, G., **Frahm, E.**, Luo, B., Missal, K. 2017. Developing FTIR microspectroscopy for analysis of plant residues on stone tools. *Journal of Archaeological Science* 78:158-178.
- Glaubergerman, P., Gasparyan, B., Wilkinson, K.N., **Frahm, E.**, Raczynski-Henk, Y., Haydosyan, H., Arakelyan, D., Karapetian, S., Nahapetyan, S., Adler, D.S. 2016. Introducing Barozh 12: A Middle Palaeolithic open-air site on the edge of the Ararat Depression, Armenia. *ARAMAZD: Armenian Journal of Near Eastern Studies* 9(2):7-20, 158-174.
- Frahm, E.**, Monnier, G.F., Jelinski, N.A., Fleming, E.P., Barber, B.L., Lambon, J.B. 2016. Chemical soil surveys at the Bremer Site (Dakota County, Minnesota, USA): Measuring phosphorous content of sediment by portable XRF and ICP-OES. *Journal of Archaeological Science* 75:115-138.
- Frahm, E.**, Feinberg, J.M., Monnier, G.F., Tostevin, G.B., Gasparyan, B., Adler, D.S. 2016. Lithic raw material units based on magnetic properties: A blind test with Armenian obsidian and application to the Middle Palaeolithic site of Lusakert Cave 1. *Journal of Archaeological Science* 74:102-123.
- Frahm, E.**, Campbell, S., Healey, H. 2016. Caucasus connections? New data and interpretations for Armenian obsidian in Northern Mesopotamia. *Journal of Archaeological Science: Reports* 9:543-564.
- Frahm, E.** 2016. Can I get chips with that? Obsidian sourcing down to the microdebitage with portable XRF. *Journal of Archaeological Science: Reports* 9:448-467.
- Frahm, E.**, Feinberg, J.M., Schmidt-Magee, B., Wilkinson, K.N., Gasparyan, B., Yeritsyan, B., Adler, D.S. 2016. Middle Palaeolithic lithic procurement behaviors at Lusakert Cave 1, Hrazdan Valley, Armenia. *Journal of Human Evolution* 91:73-92.
- Frahm, E.**, Feinberg, J.M. 2015. Reassessing obsidian field relationships at Glass Buttes, Oregon. *Journal of Archaeological Science: Reports* 2:654-665.
- Stillinger, M.D., Feinberg, J.M., **Frahm, E.** 2015. Refining the archaeomagnetic dating curve for the Near East: New intensity data from Bronze Age ceramics at Tell Mozan, Syria. *Journal of Archaeological Science* 53:345-355.
- Adler, D.S., Wilkinson, K.N., Blockley, S., Mark, D., Pinhasi, R., Schmidt-Magee, B.A., Nahapetyan, S., Mallol, C., Berna, F., Glaubergerman, P.J., Raczynski-Henk, Y., Wales, N., **Frahm, E.**, Jöris, O., MacLeod, A., Smith, V., Cullen, V., Gasparyan, B. 2014. Early Levallois technology and the transition from the Lower to Middle Palaeolithic in the Southern Caucasus. *Science* 345 (6204):1609-1613.
- Frahm, E.** 2014. Characterizing obsidian sources with portable XRF: Accuracy, reproducibility, and field relationships in a case study from Armenia. *Journal of Archaeological Science* 49:105-125.

- Frahm, E.,** Feinberg, J.M., Schmidt-Magee, B.A., Wilkinson, K.N., Gasparyan, B., Yeritsyan, B., Karapetian, S., Meliksetian, Kh., Muth, M.J., Adler, D.S. 2014. Sourcing geochemically identical obsidian: Multiscalar magnetic variations in the Gutansar volcanic complex and implications for Palaeolithic research in Armenia. *Journal of Archaeological Science* 47:164-178.
- Frahm, E.** 2014. Buying local or ancient outsourcing? Locating production of prismatic obsidian blades in Bronze-Age Northern Mesopotamia. *Journal of Archaeological Science* 41:605-621.
- Frahm, E.,** Schmidt, B., Gasparyan, B., Yeritsyan, B., Karapetian, S., Meliksetian, Kh., Adler, D.S. 2014. Ten seconds in the field: Rapid Armenian obsidian sourcing with portable XRF to inform excavations and surveys. *Journal of Archaeological Science* 41:333-348.
- Frahm, E.,** Doonan, R.C.P., Kilikoglou, V. 2014. Handheld portable X-ray fluorescence of Aegean obsidians. *Archaeometry* 56:228-260.
- Frahm, E.,** Feinberg, J.M. 2013. From flow to quarry: Magnetic properties of obsidian and changing the scales of archaeological sourcing. *Journal of Archaeological Science* 40:3706-3721.
- Frahm, E.,** Feinberg, J.M. 2013. Environment and collapse: Eastern Anatolian obsidians at Urkesh (Tell Mozan, Syria) and the third-millennium Mesopotamian urban crisis. *Journal of Archaeological Science* 40(4):1866-1878.
- Frahm, E.,** Feinberg, J.M. 2013. Empires and resources: Central Anatolian obsidian at Urkesh (Tell Mozan, Syria) during the Akkadian period. *Journal of Archaeological Science* 40(2):1122-1135.
- Frahm, E.,** Doonan, R.C.P. 2013. The technological versus methodological revolution of portable XRF in archaeology (review). *Journal of Archaeological Science* 40(2):1425-1434.
- Frahm, E.** 2013. Is obsidian sourcing about geochemistry or archaeology? A reply to Speakman and Shackley (commentary). *Journal of Archaeological Science* 40(2):1444-1448.
- Frahm, E.** 2013. Validity of “off-the-shelf” handheld portable XRF for sourcing Near Eastern obsidian chip debris. *Journal of Archaeological Science* 40(2):1080-1092.
- Frahm, E.** 2012. Distinguishing Nemrut Dağ and Bingöl A obsidians: Geochemical and landscape differences and the archaeological implications. *Journal of Archaeological Science* 39:1435-1444.
- Frahm, E.** 2012. Evaluation of archaeological sourcing techniques: Reconsidering and re-deriving Hughes’ four-fold assessment scheme. *Geoarchaeology: An International Journal* 27(2):166-174.
- Frahm, E.** 2012. Non-destructive sourcing of Bronze-Age Near Eastern obsidian artefacts: redeveloping and reassessing electron microprobe analysis for obsidian sourcing. *Archaeometry* 54(4):623-642.

Non-Reviewed Articles

- Frahm, E.** 2017. First hands-on tests of an Olympus Vanta portable XRF analyzer to source Armenian obsidian artifacts. *International Association for Obsidian Studies Bulletin* 58:8-23.
- Frahm, E.,** Feinberg, J.M. 2015. Adding geochemistry to the IRM toolkit: Acquisition of a portable X-ray fluorescence spectrometer. *The IRM Quarterly* 25(4):1,9-11.
- Frahm, E.** 2013. Obsidian sourcing, dating, and technology in the New World: Readings from *American Antiquity* and *Latin American Antiquity* (1962-2012). *International Association for Obsidian Studies Bulletin* 48:21-26.
- Frahm, E.** 2013. Gegham style: Applying obsidian magnetic studies in central Armenia. *The IRM Quarterly* 23(2):2-3.
- Frahm, E.** 2011. Climate change, globalization, and other “modern” issues in ancient Syria (feature article). *Syrian Studies Association Bulletin* 16(2).
- Frahm, E.,** Nikolaidou, M., Kelly-Buccellati, M. 2008. Using image analysis software to correlate sherd scans in the field and X-ray element maps in the laboratory. *Bulletin of the Society for Archaeological Sciences* 31(2):8-12.
- Frahm, E.** 2007. Microanalytical characterization of native copper artifacts in order to differentiate raw material sources. *Microscopy and Microanalysis* 13(S02):1108-1109.

Book Sections

- Frahm, E.** 2019. Seen Through a Glass Darkly: Reexamining Connections Between Mesopotamia and the Caucasus. Forthcoming book project.
- Healey, H., **Frahm, E.** 2018. Chapter 6: Tell Atchana lithics from LB II contexts. *Tell Atchana, Alalakh, The 2006-2010 Seasons. Volume 2: The Late Bronze Age II City* (K.A. Yener, M. Akar, M. Horowitz, editors), Koç University Press.
- Frahm, E.** 2016. Scanning electron microscopy (SEM). *Encyclopedia of Geoarchaeology* (A. Gilbert, editor), Springer, pp. 755-764.
- Frahm, E.** 2015. Scanning electron microscopy (SEM). *Archaeology of Food: An Encyclopedia* (K. Bescherer Metheny and M.C. Beaudry, editors), Vol. 2, Alta Mira, pp. 450-451.
- Frahm, E.** 2014. Keeping up with the excavations: Rapid obsidian sourcing in the field with portable XRF. *The NARNIA Project: Integrating Approaches to Ancient Material Studies* (V. Kassianidou and M. Dikomitou-Eliadou, editors), University of Cyprus, pp. 262-272.
- Frahm, E.** 2014. Chapter 8: What constitutes an obsidian “source”? Landscape and geochemical considerations and their archaeological implications. *Twenty-Five Years on the Cutting Edge of Obsidian Studies* (C. Dillian, editor), IAOS, pp. 49-70.
- Frahm, E.** 2014. Chapter 19: Fifty years of obsidian sourcing in the Near East: Considering the archaeological *zeitgeist* and legacies of Renfrew, Dixon, and Cann. *Twenty-Five Years on the Cutting Edge of Obsidian Studies* (C. Dillian, editor), IAOS, pp. 169-188.
- Frahm, E.** 2013. Scanning electron microscopy (SEM): Applications in archaeology. *Encyclopedia of Global Archaeology* (C. Smith, editor), Springer Press, pp. 6487-6495.

TEACHING

Instructor of Record

Yale University

- Introduction to Archaeological Lab Sciences (ANTH/ARCG 316L/716L)
- Introduction to Experimental Archaeology (ANTH/ARCG 559, Spring 2019)
- Geoarchaeology (ANTH/ARCG/G&G 336/636 & reading course)
- Archaeology of Death (ANTH/ARCG 953 reading course)

University of Minnesota

- Introduction to Archaeology (ANTH 3001)
- Anthropology of the Modern Middle East (ANTH 3021W/5021W)
- Analysis of Stone Tool Technology (ANTH 5269)
- Electron Microprobe Theory & Practice (ESCI/MATS 5353)
- Geoarchaeology (ANTH 5990 & ESCI 5980)

Field Courses & Schools

- Instructor*, Ground-Penetrating Radar, Cotzumalguapa, Guatemala, Yale University — 2018
- Field Staff*, Field School in Armenian Prehistory, University of Connecticut — 2011, 2015-2017
- Co-organizer*, Planning and Undertaking *In Situ* Geochemical Surveys, Cyprus — 2013
- Co-organizer*, Magnetic and Geochemical Characterization of Obsidian, New Mexico — 2013

Workshops

- Co-organizer*, Spectroscopy of Cultural Heritage Materials: Choosing the Right Technique(s), Peabody Museum of Archaeology and Ethnology, Harvard University — 2012
- Co-organizer*, Introduction to Portable XRF in Archaeology, University of Sheffield — 2013
- Experimental Archaeology Facilitator*, Introduction to the Archaeometallurgy of Cyprus — 2012
- Instructor*, Understanding Archaeological Ceramic Research Design, University of Sheffield — 2012

Other Teaching

Advisor, Laboratory Methods in Archaeology (ANTH 4007) — 2011
Curriculum Developer, Energy and the Environment (PHYS 1001W) — 2001, 2002
Teaching Assistant, Energy and the Environment (PHYS 1001W) — 2000-2001
Award: Outstanding Teaching Assistant, University of Minnesota — 2001

Select Guest Lectures

Yale University

Courses: Human Ecology (2017), Archaeological Ceramics (2017), Lithic Technology (2017), Ancient Civilizations of Mesoamerica (2017), Great Hoaxes and Fantasies in Archaeology (2017)

University of Minnesota

Courses: Microarchaeology (2016), Anthropology of the Modern Middle East (2008), Analysis of Stone Tool Technology (2008)

Other institutions

Courses: Archaeological Science (Franklin & Marshall, 2014), Science, Nationalism, Ethics, and Cultural Property (Carleton College, 2014), Material Culture (University of Manchester, 2012)

Select Professionalization

Faculty Teaching Academy, Center for Teaching and Learning, Yale University — 2018
Summer Institute on Course (Re)Design, Center for Teaching and Learning, Yale University — 2018

Graduate Coursework in Education

Pedagogy for Anthropology (ANTH 8217), University of Minnesota — 2001
Topics in Curriculum and Instruction (C&I 5540), University of Minnesota — 1999, 2000

RESEARCH & FIELDWORK

Pleistocene Archaeology, Geochronology, and Environment of the Southern Caucasus (PAGES) Project, director: Keith Wilkinson (University of Winchester) — 2016-Present

Lithic Residue Analysis, co-PI with Gilliane Monnier (University of Minnesota) — 2015-2016

Reconstructing Prehistoric Lifeways at the Bremer Site, Dakota County, Minnesota, through Microarchaeology, director: Gilliane Monnier (University of Minnesota) — 2015-2016

Kenyan Obsidian Resources and Landscapes (KORAL), co-director with Christian Tryon (Harvard University), studying Late Stone Age pastoralist/forager-fisher interactions — 2014-Present

Tübingen-Armenian Paleolithic Project (TAPP), PIs include Andrew Kandel (Tübingen University) and Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia) — 2012-Present

Palaeolithic Populations in Armenia and Turkey: Expanding Archaeological Understanding (PLATEAU) Project, director: Philip Glauberman (Middle East Technical University) — 2012-2015

New Archaeological Research Network for Integrating Approaches to Ancient Material Studies in the Eastern Mediterranean (NARNIA) Project, Work Package 7 co-PI with Roger Doonan (University of Sheffield), project coordinator: Vasiliki Kassianidou (University of Cyprus) — 2012-2014

Obsidian Resources and Landscapes of Palaeolithic Armenia, co-director with Daniel Adler (UConn) and Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia) — 2011-Present

Hrazdan Gorge Palaeolithic Project, directors: Daniel Adler (UConn) and Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia) — 2011-Present

Obsidian Technology and Trade in Northern Mesopotamia, project collaborators: Stuart Campbell and Elizabeth Healey (University of Manchester) — 2011-2013

Magnetic Obsidian: Lithic Technology and Exchange Networks (MOLTEN) Project, co-director with Joshua Feinberg (Institute for Rock Magnetism, University of Minnesota) — 2008-Present

Obsidian Artifact Hydration: Chronology and Palaeoenvironment, collaborator: Phillip D. Ihinger (University of Wisconsin-Eau Claire) — 2008-2011
Ceramics at Tell Mozan: Chronology and Technology, collaborators: Marianna Nikolaidou (UCLA), Marilyn Kelly-Buccellati (Cal State), and Joshua Feinberg (Minnesota) — 2006-2011, 2017
Bronze-Age Obsidian Industry of Tell Mozan, site directors: Giorgio Buccellati (UCLA) and Marilyn Kelly-Buccellati (California State University, Los Angeles) — 2005-2010
Old Copper Culture Project, director: George Rapp (University of Minnesota-Duluth) — 2001-2003
Miscellaneous research/fieldwork in England, Greece, Cyprus, Armenia, Minnesota, and Oregon

ADVISING & MENTORING

Master's Level

Michele Stillingner (co-advisor, UMN, 2011-2013, Award: University of Minnesota's Distinguished Master's Thesis in the Social Sciences), *Kefilwe Rammutloa* (thesis reader, Yale, 2017-Present)

Doctoral Level

Lingyi Zeng (committee member, Yale, 2017-Present)

Select Undergraduate Mentoring

Michelle Muth (Rice University, 2013), *Giselle Conde* (UWEC, 2008-2011), *Steven Newman*, (UMN, 2011), *Amy Hillis* (Macalester College, 2010), *Charissa Johnson* (UMN, 2008-2010)

LEADERSHIP & SERVICE

Recent Activities

Funding Committee Member; Anthropological, Environmental, and Geological Interdisciplinary Sciences (AEGIS) Group, University of Minnesota — 2016
Outreach Committee Member; Anthropological, Environmental, and Geological Interdisciplinary Sciences (AEGIS) Group, University of Minnesota — 2015-2016
Testing for lead and other toxic metals in Minneapolis-St. Paul neighborhoods — 2015-2016
Mentoring/advising via Grinnell's First Generation College Students organization — 2014-2016

Program Evaluation

Evaluation team member for the Science Museum of Minnesota's Community Partnerships Serving Science Project with local science-based organizations and clubs — 2003-2007

Professional Society Leadership

Vice President & Executive Board (2011-2012), *President & Chief Executive Officer* (2012-2014), and *Past President & Executive Board* (2014-2015), International Association for Obsidian Studies
Co-chair, Geoarchaeology Interest Group, Society for American Archaeology — 2009-2010
Student Representative, Management Board, GSA Archaeological Geology Division — 2005-2009

Departmental Committees

Senior Essay Prize Selection Committee, Anthropology, Yale University — 2018-Present
Analytical Facilities Committee, Earth Sciences, University of Minnesota — 2003-2011
Departmental Safety Committee, Earth Sciences, University of Minnesota — 2003-2011

Manuscript & Grant Reviewing

Manuscript reviewer — *Journal of Archaeological Science* (n=14); *Journal of Archaeological Science: Reports* (17); *Journal of Field Archaeology* (1); *ACS Archaeological Chemistry* (2); *Archaeometry*

(2); *Antiquity* (2); *Geoarchaeology* (3); *PaleoAnthropology* (2); *PLoS ONE* (1); 7th International Conference on the Chipped and Ground Stone Industries of the PPN Proceedings (1); *American Mineralogist* (2); British Archaeological Reports (1); *Quaternary Research* (2); *Scientific Reports* (2); *STAR: Science & Technology of Archaeological Research* (1); *Quaternary International* (2); *Archaeological and Anthropological Sciences* (1), *Applied Radiation and Isotopes* (1)

Grant reviewer — NSF Doctoral Dissertation Improvement Program (n=2); NSF Major Research Instrumentation Program (1); NSF Archaeometry Program (1); Leakey Foundation (1)

Conference Session Organization

Archaeometry in the Service of African Archaeology, Society of Africanist Archaeologists (SAFA) 24th biennial conference — 2018

What's Hot in Pyrotechnology? Controlling Fire from Campfires to Craftspeople. Society for American Archaeology (SAA), co-organized with Lingyi Zeng and Michelle Young — 2018

Obsidian from Magma to Artifact: Geological and Archaeological Perspectives. Geological Society of America (GSA) annual meeting, co-organized with Joshua Feinberg — 2009

Select Other Activities

Collected and shared archaeological research news at the Geo • Arch • Sci website — 2007-2013

Gave high-school students tours of laboratories at the University of Minnesota — 2003-2011

Briefed the new Norwegian ambassador to Syria on the country and its cultures — 2008

AWARDS, SUPPORT, AND GRANTS

Honors & Awards

Best Dissertation Award in the Social and Behavioral Sciences and Education (2010-12), University of Minnesota Graduate School; winner after nomination by the department — \$1000 — 2012

Graduate Research Award, Sigma Xi, University of Minnesota Chapter — \$500 — 2010

Scholarships

Full tuition and fees — Regents' Scholarship, University of Minnesota — 2003-2009

Consultancy

\$600,000+ of external support (commercial and academic consultancy) for an analytical laboratory, including funding for undergraduate and graduate research assistants — 2003-2011

Research, Teaching, and Travel Grants

\$25,000 — CURE (Course-based Undergraduate Research Experiences) class development grant, Howard Hughes Medical Institute's Campus Grant to Yale University — 2018-2019

\$45,000 — Instructional equipment grant, Provost for Research Office, Yale University — 2017

\$8550 — Total grants from the Albers-Coe-Hazard Funds, Yale University — awarded to Frahm to support conference travel, field equipment, and fieldwork — 2017-2018

A High-Resolution Chronology for Early Humans in the Southern Caucasus. Investigator with Keith Wilkinson (University of Winchester) and Daniel Adler (UConn), Leverhulme Trust award of £387,792 to the PAGES Project; Leverhulme PDRA fellowship declined — 2016

\$43,820 — Thermo Fisher Scientific Niton XL3t 950 Mining Analyzer. Co-PI with Joshua Feinberg (Earth Sciences), Gilbert Tostevin (Anthropology), and Kyungsoo Yoo (Soil, Water, & Climate); \$30,674 (70%) from Grant-in-Aid of Research, Artistry, and Scholarship Program, University of Minnesota and \$13,146 (30%) from multi-departmental matches — 2015

\$2000 — Grant from the Alexander Dubcek Fund, Global Programs and Strategy Alliance, University of Minnesota — awarded to Frahm to support fieldwork in Armenia — 2014

\$4000 — Visiting Research Fellowship, Institute for Rock Magnetism, funded by the NSF, awarded to Frahm to conduct magnetic sourcing of Armenian obsidian artifacts — 2013

\$58,400 — *Magnetic and Geochemical Characterization of In Situ Obsidian*, Research Opportunities for Undergraduates Program; Keck Consortium Grant — co-authored with Robert Sternberg (Franklin & Marshall), Joshua Feinberg (Minnesota), and M. Steven Shackley (New Mexico) to support fieldwork in New Mexico and subsequent student projects — 2013-2014
\$1060 — Learned Societies Grants, University of Sheffield — awarded to Frahm — 2012-2013
\$32,000 — Award of \$19,200 (60%) from Grant-in-Aid of Research University of Minnesota and \$12,800 (40%) via matches — awarded to Hirschmann (Earth Sciences) and Frahm — 2009
\$50,000 — Subsidy Program for Archaeological Research, Electron Microprobe Lab, Department of Earth Sciences, University of Minnesota — analytical subsidy awarded to Frahm — 2008-2009
\$4700 — Research Grants, Graduate School & Anthropology, University of Minnesota — awarded to Frahm for dissertation research on the Tell Mozan lithic assemblage — 2008-2010
\$20,000 — Award of \$10,000 (50%) from Grant-in-Aid of Research; University of Minnesota and \$10,000 (50%) via matches — awarded to Whitney (Earth Sciences) and Frahm — 2008
\$1200 — Travel Grants, Anthropology, University of Minnesota — awarded to Frahm — 2007-2009
\$200 — Student Travel Award, Archaeological Sciences of the Americas Symposium — 2004

SELECT PRESS COVERAGE

Study uses fire to examine Kenyan migration patterns, *Yale Daily News*, [27 February 2018](#)
Tool sharpens focus on Stone Age networking in the Middle East, *Science News*, [23 May 2017](#)
Paleolithic Obsidian Transported Long Distances, *Archaeology Magazine* Headlines, [10 May 2017](#)
Digs Reveal Stone-Age Weapons Industry With Staggering Output, *National Geographic*, [April 2015](#)
Point-and-Shoot Obsidian Analysis, *Archaeology Magazine*, [January/February 2014](#)
Year in Science (Five leading science themes of 2013), *NBC News*, [28 December 2013](#)
Sourcing Obsidian Tools, *World Archaeology Magazine*, [October/November 2013](#)
High-Definition Obsidian, *Archaeology Magazine*, [September/October 2013](#)
How Today's Archaeologists Kick Indiana Jones' Butt, *LiveScience*, [30 September 2013](#)
Archaeological Technology: Rapid Diggers, *The Economist*, Babbage Blog, [22 September 2013](#)
BBC Radio Sheffield's "Expert Slot," *Paulette Edwards' Show*, 13 September 2013
High-Definition Sourcing Pinpoints Ancient Obsidian Quarries, *EARTH Magazine*, [Sept 2013 issue](#)
BBC World Service's *Science in Action* with Jon Stewart, "Cities," [week of 23 May 2013](#)
A King's Overreaching, Traced in Black Glass, *Wall Street Journal*, [16 March 2013 issue](#)
Fall of an Ancient Empire Linked to Crisis in Syria, *Nature News*, 21 Feb 2013, [doi:10.1038/nature.2013.12486](https://doi.org/10.1038/nature.2013.12486) and *Nature Middle East*, 18 Feb 2013, [doi:10.1038/nmiddleeast.2013.25](https://doi.org/10.1038/nmiddleeast.2013.25)
Obsidian and Empire, *Archaeology Magazine*, [January/February 2013 issue](#)
Glass Acts from an Ancient World, *The Star*, [10 September 2012 issue](#)

PRESENTATIONS & REPORTS

Book Review

Frahm, E. 2012. Invited review of *The Field Description of Igneous Rocks* (Jerram and Petford 2011), *Sedimentary Rocks in the Field: A Practical Guide* (Tucker 2011), and *Field Geophysics* (Milsom and Eriksen 2011). *Geoarchaeology* 27(2): 176-179.

Recent Conference Presentations (Since 2011)

Frahm, E. 2018. Advances in portable XRF for obsidian sourcing in Eastern Africa. Archaeometry in the Service of African Archaeology. Society of Africanist Archaeologists (SAfA) 24th biennial conference, Toronto, Canada, 18-21 June.
Frahm, E. 2018. Pack your boots, trowel, and ray gun: Advances in portable XRF for archaeological science. Session: Next Generation Archaeological Science. Society for American Archaeology Annual Meeting, Washington, D.C., 11-15 April.
Luo, B., Monnier, G., **Frahm, E.**, Missal, K. 2017. FTIR Microscopic Analysis of Plant and Animal Tissue Residues on Stone Tools. SciX, Reno, Nevada, 8-13 October.

- Adler, D.S., Wilkinson, K.N., Blockley, S., **Frahm, E.**, Mark, D., Mallol, C., Nahapetyan, S., Beverly, E., Glauberman, P.J., Raczynski-Henk, Y., Gill, J., Knul, M., Timms, R., Gasparyan, B. 2017. The Relevance of Nor Geghi 1 (Armenia) to the Behavioral and Technological Evolution of Middle Pleistocene Hominins in the Southern Caucasus. European Society for Human Evolution annual meeting, Leiden, 21-23rd September.
- Glauberman, P., Gasparyan, B., **Frahm, E.**, Li, B., Raczynski-Henk, Y., Haydosyan, H., Arakelyan, D. 2017. Late Middle Paleolithic technological organization in the Armenian volcanic highlands: a case study from the site of Barozh 12. European Society for Human Evolution annual meeting, Leiden, 21-23rd September.
- Malinsky-Buller, A., Glauberman P.J., Beverly, E.J., Sherri, J., **Frahm, E.**, Nahapetyan, S., Karapetyan, S., Wilkinson, K., Gasparyan, B., Adler, D.S. 2017. Alapars 1 - A New Middle/Upper Pleistocene Paleoenvironmental and Archaeological Record from Armenia. European Society for Human Evolution annual meeting, Leiden, 21-23rd September.
- Brittingham, A., Hren, M.T., Kandel, A.W., **Frahm, E.**, Gasparyan, B., Hartman, G. 2016. Climate impact on human behavior in the Upper Paleolithic of the Armenian Highlands. Geological Society of America annual meeting, Denver, Colorado, 25-28 September.
- Adler, D.S., Wilkinson, K.N., Blockley, S., **Frahm, E.**, Mark, D., Mallol, C., Nahapetyan, S., Beverly, E., Gasparian, B. 2016. Nor Geghi 1: Its Middle Pleistocene Geological Context and Relevance to Palaeolithic Archaeology in the Southern Caucasus. The INQUA-SEQS 2016 Meeting: Quaternary Sedimentation and Paleolithic Human Occupation in Armenia and South Georgia, Yerevan, Armenia, 3-11 September.
- Glauberman, P.J., Gasparian, B., Wilkinson, K.N., **Frahm, E.**, Nahapetyan, S., Arakelyan, D., Kaczynski-Henk, Y., Haxydosyan, H., Adler, D.S. 2016. Barozh 12: Stratified Middle Palaeolithic Occupations in an Upper Pleistocene Flood Plain Setting at the Edge of the Ararat Depression, Armenia. The INQUA-SEQS 2016 Meeting: Quaternary Sedimentation and Paleolithic Human Occupation in Armenia and South Georgia, Yerevan, Armenia, 3-11 September.
- Malinsky-Buller, A., Glauberman, P.J., Beverly, E., Sherriff, J., Wilkinson, K., **Frahm, E.**, Nahapetyan, S., Gasparian, B., Adler, D.S. 2016. Alapars 1: A new long-term paleoenvironmental and prehistoric record from the Hrazdan Gorge, Armenia. The INQUA-SEQS 2016 Meeting: Quaternary Sedimentation and Paleolithic Human Occupation in Armenia and South Georgia, Yerevan, Armenia, 3-11 September.
- Glauberman, P.J., Gasparyan, B., Kuhn, S., Wilkinson, K., **Frahm, E.**, Raczynski-Henk, Y., Haydosyan, H., Nahapetyan, S., Arakelyan, D., Adler, D.S. 2016. Technological Divergence at the Crossroads? Comparing the Obsidian Middle Palaeolithic in the Armenian Volcanic Highlands and Central Anatolia. European Society for Human Evolution meeting, Madrid, 15-17 September.
- Kandel, A.W., Gasparyan, B., **Frahm, E.** 2016. Transport patterns of Armenian obsidian based on pXRF analysis of Upper Paleolithic artifacts from Aghitu-3 Cave. European Society for Human Evolution meeting, Madrid, 15-17 September.
- Anderson, N.T., Steenberg, J., Walters, A., Retzler, A., **Frahm, E.**, Feinberg, J.M., Dworkin, S.I., Cowan, C., Runkel, A. 2015. High-resolution Chemostratigraphy Through a Nearshore, Mixed Carbonate-Shale Succession of Late Ordovician Age (Sandbian-Katian) in the Laurentian Cratonic Interior. American Geophysical Union, Fall Meeting, December.
- Adler, D.S., Wilkinson, K.N., Blockley, S., Mark, D., **Frahm, E.**, Schmidt-Magee, B., Glauberman, P., Raczynski-Henk, Y., Jöris, O., Gasparyan, B. 2015. Early Levallois Technology and the Transition from the Lower to Middle Palaeolithic in the Southern Caucasus. International ROCEEH Conference on Human Expansions, Frankfurt, Germany, 13-17 July.
- Frahm, E.** 2015. Exploring Hominin Cognition via Palaeolithic Obsidian Provisioning, Transport, and Technology. Session: Exotic, Lustrous, and Colorful: Obsidian in Symbol, Society and Ceremony. Society for American Archaeology Annual Meeting, San Francisco, 15-19 April.
- Frahm, E.**, Adler, D.S., Feinberg, J.M., Wilkinson, K., Gasparyan, B. 2015. Developing Geochemical and Magnetic Studies of Obsidian Lithic Assemblages: A Case Study in the Hrazdan Valley, Central Armenia. Paleoanthropology Society Meeting in San Francisco, 13-14 April.
- Adler, D.S., Wilkinson, K., Blockley, S., Mark, D., **Frahm, E.**, Schmidt-Magee, B.A., Glauberman, P.J., Raczynski-Henk, Y., Jöris, O., Gasparyan, B. 2015. Early Levallois Technology and the Transition from the Lower to Middle Paleolithic in the Southern Caucasus. Paleoanthropology Society

- Meeting in San Francisco, California, 13-14 April.
- Wilkinson, K., Adler, D.S., Blockley, S., **Frahm, E.**, Mark, D., Mallol, C., Nahapetyan, S., Gasparyan, B. 2015. Paleolandscape Context for Lower-Middle Paleolithic Activity in the Hrazdan Valley, Central Armenia. Paleoanthropology Society Meeting in San Francisco, 13-14 April.
- Glaubergerman, P., Gasparyan, B., Kuhn, S., Wilkinson, K., **Frahm, E.**, Raczynski-Henk, Y., Haydosyan, H., Nahapetyan, S., Arakelyan, D., Adler, D.S. 2015. Hominin Population Dynamics and Dispersals in the Armenian Highlands and Anatolia: New Data from Barozh 12, a Middle Paleolithic Open-Air Site on the Edge of the Ararat Depression, Armenia. Paleoanthropology Society Meeting in San Francisco, California, 13-14 April.
- Glaubergerman, P.J., Gasparyan, B., Wilkinson, K.N., **Frahm, E.**, Raczynski-Henk, Y., Adler, D.S. 2014. Dissecting Palimpsests at Barozh 12: Ongoing Research at a New Middle Palaeolithic Open-Air Site on the Edge of the Ararat Depression, Armenia. XVII Mundial Congress of Prehistoric and Protohistoric Sciences, World UISPP Congress, Burgos, Spain, 1-7 September.
- Frahm, E.** 2014. Where Obsidian Sourcing Isn't Long-Distance Trade: Landscapes, Provisioning Strategies, and Organization of Space. Session: The Gold Anniversary of Obsidian Sourcing: Fifty Years of Research Around the World. Society for American Archaeology, Austin, TX, 23-27 April.
- Feinberg, J.M., **Frahm, E.**, Muth, M.J. 2013. Magnetic Studies of Archaeological Obsidian: Variability of Eruptive Conditions within Obsidian Flows is Key to High-Resolution Artifact Sourcing. Session: Magnetic Studies of Igneous Processes. American Geophysical Union, Fall Meeting, San Francisco, California, 9-13 December.
- Stillinger, M.D., Feinberg, J.M., **Frahm, E.** 2013. Archaeomagnetic Dating of Bronze Age Pottery in Syria: New Intensity Data for 2300 to 1000 BCE. Magnetic Studies of Igneous Processes. American Geophysical Union, Fall Meeting, San Francisco, California, 9-13 December.
- Frahm, E.** 2013. Portable XRF Applications in Archaeology. Recent Developments in the Interdisciplinary Study of Ancient Materials from the Eastern Mediterranean Symposium. University of Cyprus, Nicosia, Cyprus, 7-8 November.
- Glaubergerman, P., Gasparyan, B., Wilkinson, K., **Frahm, E.**, Raczynski-Henk, Y., Adler, D.S. 2013. Barozh 12: A New Middle Palaeolithic Open-Air Site on the Edge of the Ararat Plain, Armenia. The Role of the Southern Caucasus on Early Human Evolution and Expansion: Refuge, Hub or Source Area? Tbilisi, Georgia, 15-20 October.
- Adler, D.S., Wilkinson, K., Blockley, S., Mark, D., Pinhasi, R., Schmidt, B., Yeritsyan, B., **Frahm, E.**, Gasparyan, B. 2013. Early Evidence for Levallois Technology and the Transition from the Lower to Middle Palaeolithic in the Caucasus: New Data from Nor Geghi 1, Armenia. The Role of the Southern Caucasus on Early Human Evolution and Expansion: Refuge, Hub or Source Area? Tbilisi, Georgia, 15-20 October.
- Frahm, E.** 2013. Obsidian Resources and Landscapes of Palaeolithic Armenia: Human Mobility, Subsistence, and Settlement. Human Development in Landscapes Symposium, Christian-Albrechts-Universität zu Kiel, Kiel, Germany, 22 August.
- Kandel, A.W., Gasparyan, B., Bruch, A.A., Deckers, K., **Frahm, E.**, Nahapetyan, S., Weissbrod, L. 2013. Onwards and Upwards in the Caucasus: A Multidisciplinary Approach to Understanding the Lifeways of the Earliest Modern Humans in Armenia. European Geosciences Union, 8-12 April.
- Frahm, E.** 2013. Place, Practice, and pXRF: Merging Archaeological Fieldwork and Labwork. Session: Improving XRF Methods for the Geochemical Characterization of Archaeological Materials. Society for American Archaeology Annual Meeting, Honolulu, 3-7 April.
- Kandel, A.W., Gasparyan, B., **Frahm, E.**, Taller, A., Weissbrod, L. 2013. Latest Results from Aghitu-3, an Early Upper Paleolithic Cave Site in Armenia. Hugo Obermaier Society for Quaternary Research and Archaeology of the Stone Age Meeting, Vienna, 2-6 April.
- Frahm, E.** 2012. Environmental Archaeology and Obsidian Studies: Progress and Prospects. Session: A World of Obsidian: Sourcing, Dating, and Beyond. Society for American Archaeology Annual Meeting, Memphis, Tennessee, 18-22 April.
- Stillinger, M.D., Feinberg, J.M., **Frahm, E.** 2011. Magnetic Intensity Dating of Pottery from Ancient Urkesh, Tell Mozan, Syria. Students in Archaeology: Presentations of Recent Fieldwork. Archaeological Institute of America, Minnesota Chapter, 22 October.
- Stillinger, M.D., Feinberg, J.M., **Frahm, E.** 2011. Archaeointensity Dating of Pottery Sherds from the Ancient City of Urkesh, Tell Mozan, Syria. Session: Topics in Geoarchaeology: Reconstructions

of Ancient Landscapes and Paleoenvironments. Geological Society of America Conference, Minneapolis, Minnesota, 9-12 October. *Richard Hay Student Award, Archaeological Geology Division of the Geological Society of America.*

Conde, G., Ihinger, P.D., **Frahm, E.** 2011. Chemical Exchange Accompanying Obsidian-Perlite Transition in the Natural Environment. Session: Volcanology. Geological Society of America Annual Meeting, Minneapolis, Minnesota, 9-12 October.

Recent Invited Lectures (Since 2011)

Archaeology Seminar Series, Boston University, 18 October 2018.

Faster, Stronger, Smarter: Next-Generation Portable XRF in the Archaeological Sciences. Frontiers in Archaeological Sciences international workshop, Center for Human Evolutionary Studies, Rutgers University, 23-25 October 2017.

Putting People in Their Place: Landscape and Resource Use During Climatic, Social, and Evolutionary Change. Colorado College Anthropology Department seminar, 16 October 2015.

Putting Neanderthals in their Place: Mobility, Provisioning, and Landscape Use in Palaeolithic Armenia. Old World Archaeology Beer Hour, University of Connecticut, 4 December 2014.

Putting Neanderthals in their Place: Mobility, Provisioning, and Landscape Use in Palaeolithic Armenia. Archaeology Program Seminar Series, Harvard University, 3 December 2014.

Neanderthals and Magnetite: Spatial and Behavioral Patterns in Obsidian Magnetism at Gutansar Volcano, Armenia. Institute for Rock Magnetism Lecture, University of Minnesota, 15 May 2014.

Understanding Neanderthal Lifeways in Palaeolithic Armenia: Geochemistry, Magnetism, and Technology of Obsidian Tools. 16th Annual Geoarchaeology Lecture, Department of Earth and Environment, Franklin & Marshall College, 11 April 2014.

Stone Tools, Ray Guns, and Rock Magnetism: A Multidisciplinary Approach to Hominin Lithic Technology in Palaeolithic Armenia. Archaeological Sciences Graduate Group Colloquium, University of Minnesota, 18 April 2014.

Understanding Lifeways and Ecology in Palaeolithic Armenia: Geochemistry, Magnetism, and Technology of Neanderthals' Obsidian Tools. Carleton College, Geology Department Invited Lecture, 18 February 2014.

Stone Tools, Ray Guns, and Rock Magnetism: A Multidisciplinary Approach to Understanding Hominin Lifeways and Pleistocene Ecology in Palaeolithic Armenia. University of Iowa, Department of Earth and Environmental Sciences Seminar Series, 14 February 2014.

Spatial Patterning in Obsidian Magnetic Properties of the Gutansar Volcanic Complex in Armenia. Institute for Rock Magnetism Lecture, University of Minnesota, 24 July 2013.

Kandel, A.W., Gasparyan, B., Bruch, A.A., Deckers, K., **Frahm, E.**, Nahapetyan, S., Weissbrod, L. The Upper Paleolithic Settlement of the Armenian Highlands. Institute of Archaeology Lecture Series, Hebrew University, 30 April 2013.

Humans as a Geological Transport Mechanism: Tracing the Movement of Lithic Resources across the Ancient Near Eastern Landscape. Geological Society of Minnesota Lecture, 24 October 2011.

What Can Obsidian Reveal About Past Environments and Landscapes? Quaternary Paleoecology Seminar Series. Department of Earth Sciences, University of Minnesota, 28 September 2011.

No Matter How You Slice It: Stone Tools during the Bronze Age in Upper Mesopotamia. Archaeological Institute of America Lecture, Lawrence University, 9 May 2011.

Other Presentations (Since 2011)

Faster, Stronger, Smarter: Advances in Portable XRF for Cultural Heritage Studies. Yale Institute for the Preservation of Cultural Heritage (IPCH) Internal Seminar Series, 4 October 2017.

The Stone Age Was Complex Too: Mobility, Provisioning, and Environment in the Southern Caucasus and East African Rift. Yale Council on Archaeological Studies Brown Bag Series, 22 Sept 2017.

Putting People in Their Place: Resources, Environment, and Land Use in Palaeolithic Armenia. University of Minnesota Archaeology Consortium seminar series, 16 October 2015.

Muth, M.J., Feinberg, J.M., **Frahm, E.**, Stillinger, M.D. Magnetic Differentiation of Obsidian Volcanism at Glass Buttes, Oregon. NSF-Research Experience for Undergraduates University of Minnesota, Earth Sciences Summer Internship Poster Session. 9 August 2013.

Conde, G., Ihinger, P.D., **Frahm, E.** Chemical Effects of Glass Hydration in the Natural Environment. University of Wisconsin-Eau Claire Student Research Day, 30 April 2012. *Award: First Place, Earth and Life Sciences.*

The Bronze-Age Obsidian Industry of Tell Mozan and Current Issues in Near Eastern Obsidian Sourcing. University of Minnesota Archaeology Consortium seminar series, 25 March 2011.

Discussion and analysis of "The Syrian Bride." Undergraduate Anthropology Club Movie Night, University of Minnesota, 24 March 2011.

Select Research Reports

Report on on-site geochemical surveying at Politiko-*Phorades* for the Archaeological Research Unit, University of Cyprus, 2013.

Report on on-site geochemical surveying and obsidian sourcing at Keryneia-*Achaea* for the 6th Ephoria of Prehistoric and Classical Antiquities in Patras, Greece, 2012.

Report on on-site geochemical surveying at Korinthos-*Archea* for the 4th Ephoria of Prehistoric and Classical Antiquities in Corinth, Greece, 2012.

Reports for the European Commission on Work Package 7 of the New Archaeological Research Network for Integrating Approaches to Ancient Material Studies network, 2012-2013.

Obsidian artifact source assignments for Kenan Tepe, Domuz Tepe, and Tell Atchana, 2011.

Research report for the International Institute for Mesopotamian Area Studies Board, 2008.

Obsidian Research. The Temple Terrace of Urkesh: An In-House Report on the 19th Season, 2007.

900+ entries and files for Unit J3, Urkesh Global Record on-line excavation database, 2006-2011.

600+ scientific reports for commercial and academic consultancy (~1-2 reports/week), 2001-2011.