## Joe Roe

I am a computational archaeologist using data science to understand the economy and ecology of the first farmers in Southwest Asia. I also develop research software and open data resources that support reproducible quantitative analysis in archaeology.

View this CV online with links at https://joeroe.io/cv

# **Education**

2017 | 2013 Postgraduate studies

UCL Institute of Archaeology

- **Q** University College London
- Computational modelling of prehistoric human ecology in the Southern Levant
- Part of the Prehistoric Hunting Strategies in Jordan project
- Supervisors: Prof. Louise Martin, Prof. Andrew Bevan, Dr. Andrew Garrard

2013

MA Archaeology (Distinction)

UCL Institute of Archaeology

- University College London
- Dissertation: Cultural phylogeny of kurgan burial mounds in the west Eurasian steppe
- Supervisor: Prof. Stephen Shennan

2011

BA Anthropology & Archaeology (1st class hons.)

Departments of Anthropology & Archaeology

- Durham University
- $\bullet$  Dissertation: Spatial analysis of intra-site surface collection data from a Cucuteni-Tripolye mega-site
- Supervisor: Prof. John Chapman

2008 | 2001 Secondary education

Woodkirk High School

Leeds

### **Academic appointments**

2024

Research assistant (Projektmitarbeiter)

Institute of Archaeological Sciences

- University of Bern
- Lead developer of XRONOS, an open repository for chronometric data (PIs: Dr. Martin Hinz, Prof. Dr. Albert Hafner)
- Contributed to research project "Climate Change Resilience and Vulnerabilities of Bronze Age Waterfront Communities (2200–800 BC)" (PI: Dr. Caroline Heitz)

### **Contact**

- joeroe@hey.com
- **4** +45 60 56 37 63
- Ø joeroe.io
- **25** 0000-0002-1011-1244
- Google Scholar
- github.com/joeroe
- @ joeroe@archaeo.social
- W User:Joe Roe

### Programming

R
SQL
HTML/CSS
Javascript
Ruby
Python

Made with **pagedown** (source) Last updated 2024-12-13 2020 2017

#### Research assistant (Videnskabelig assistent)

Department of Cross-Cultural and Regional Studies

University of Copenhagen

- Responsibility for archaeological survey and spatial analysis components of major field projects in Iran and Jordan
- Developed databases and software interfaces for the projects' research data
- PIs: Dr. Tobias Richter,



#### Publications

2024

- Gaydarska, B., Roe, J., and Slavchev, V., Dietary Variability in the Varna Chalcolithic Cemeteries. European Journal of Archaeology NA. doi:10.1017/eaa.2024.33
- Batist, Z. & Roe, J., Open archaeology, open source? Collaborative practices in an emerging community of archaeological software engineers. Internet Archaeology 67. doi:10.11141/ia.67.13

2023

- Batist, Z. & Roe, J., open-archaeo: a resource for documenting archaeological software development practices. Journal of Open Archaeology Data 11: 9. doi:10.5334/joad.111
- Arranz-Otaegui, A. & Roe, J., Revisiting the concept of the 'Neolithic Founder Crops' in southwest Asia. Vegetation History and Archaeobotany 32: 475-499. doi:10.1007/s00334-023-00917-1

2022

- Arranz-Otaegui, A., Pedersen, P. N., Schmidt, A. F., Jörgensen-Lindahl, A., Roe, J., Villemoes, J., Pantos, G. A., & Killackey, K., Identifying the chaîne opératoire of club-rush (Bolboschoenus glaucus [Lam.] S.G.Sm) tuber exploitation during the Early Natufian in the Black Desert (northeastern Jordan). Journal of Archaeological Science: Reports 47. doi:10.1016/j.jasrep.2022.103677
- Jones, M., Richter, T., Rollefson, G., Rowan, Y., Roe, J., Toms, P., Wasse, A., Ikram, H., Williams, M., AlShdaifat, A., Pedersen, P. N., & Esaid, W., The palaeoenvironmental potential of the eastern Jordanian desert basins (Qe'an). Quaternary International 635: 72-82. doi:10.1016/j.quaint.2021.06.023
- Hinz, M., Roe, J., Laabs, J., Heitz, C., & Kolář, J., Bayesian inference of prehistoric population dynamics from multiple proxies: a case study from the North of the Swiss Alps. In NA, NA. NA, pp. NA. doi:10.31235/osf.io/dbcag

2021

Richter, T., Darabi, H., Alibaigi, S., Arranz-Otaegui, A., Bangsgaard, P., Khosravi, S., Maher, L., Mortensen, P., Pedersen, P., Roe, J., & Yeomans, L., The formation of Early Neolithic Communities in the Central Zagros: an 11,500 year old communal structure at Asiab. Oxford Journal of Archaeology 40 (1): 2-22. doi:10.1111/ojoa.12213

My publications reflect a number of ongoing collaborations with domain-specialist colleagues, bringing a data science perspective to addressing multidisciplinary research questions in prehistory.

Khosravi, S., Pedersen, P. N., Alibaigi, S., Roe, J., Heidary Dastenaei, M., Miladi, 2020 B., Darabi, H., Richter, T., & Mortensen, P., Archaeological Landscape of Razavar Valley in the Neolithic Period: the survey of the 8th-6th millennium BC in the north of Kermanshah Province. Pazhoheshha-ye Bastan shenasi Iran 26. doi:10.22084/NBSH.2020.21133.2094 Nebbia, M., & Roe, J., Landscape Studies. In Gaydarska, B., Early Urbanism in Europe: The Trypillia Mega-Sites of the Ukrainian Forest-Steppe. De Gruyter, pp. 60-107. doi:10.1515/9783110664959-007 Martin, L., & Roe, J., The Kheshiya Cattle Skull Ring: Zooarchaeological Analyses. In McCorriston, J., & Harrower, M. J., Landscape History of Hadramawt: The Roots of Agriculture in Southern Arabia (RASA) Project, 1998–2008. Cotsen Institute of Archaeology Press, pp. 275–348. doi:10.2307/j.ctvzgb8n3.20 Henton, E., Roe, J., Martin, L., Garrard, A., Boles, O., Lewis, J., Thirlwall, M., & 2019 Jourdon, A-L., Epipalaeolithic and Neolithic gazelle hunting in the Badia of north-east Jordan. Reconstruction of seasonal movements of herds by stable isotope and dental microwear analyses. Levant 50 (2): 127-172. doi:10.1080/00758914.2019.1598764 Jones et al., 20,000 years of societal vulnerability and adaptation to climate change in southwest Asia. WIREs Water 6 (2): e1330. doi:10.1002/wat2.1330 Arranz-Otaegui, A., González Carretero, L., Roe, J., & Richter, T., "Founder 2018 crops" v. wild plants: Assessing the plant-based diet of the last huntergatherers in southwest Asia. Quaternary Science Reviews 186: 263-283. doi:10.1016/j.quascirev.2018.02.011 Martin, L., Edwards, Y., Roe, J., & Garrard, A., Faunal turnover in the Azraq Basin, 2016 eastern Jordan 28,000 to 9,000 cal BP, signalling climate change and human impact. Quaternary Research 86 (2): 200-219. doi:10.1016/j.yqres.2016.07.001 Publications (non-peer-reviewed) Roe, J., Peer Review Report For: Inglämnlagare: a tool for restructuring Swedish 2023 HER record site data for statistical analysis [version 2; peer review: 3 approved]. F1000Research 11 (1370). doi:10.5256/f1000research.157510.r222117 Roe, J., PIA at 25: A Retrospective. Papers from the Institute of Archaeology 25 (2): 2016 p.Art. 16. doi:10.5334/pia.517 Allentuck, A., Martin, L., & Roe, J., Refuse Disposal in the Early Epipalaeolithic? 2015 Preliminary Zooarchaeological Evidence from Kharaneh IV, Eastern Jordan. Bulletin of the Council for British Research in the Levant 10: 67–69. doi:10.1179/1752726015Z.00000000034 Roe, J., Review of Green Arabia: Human Prehistory at the Crossroads of 2014 Continents. Papers from the Institute of Archaeology 24 (1). doi:10.5334/pia.458

Conference presentations

- Heitz, C., Ismail-Meyer, K., Aellen, C., & Roe, J., Coping with the Cold Climate Change Resilience and Vulnerabilities of Bronze Age Communities during the 3.7 ka 'Löbben' Glacier Advance (ca. 1900–1450 BCE). Presented at Climate of the Past and Societal Responses to Environmental Changes (Climpast), Bern, 5–8 June 2024.
- Roe, J. & Hinz, M., XRONOS as a Resource for Archaeological Chronology in West Asia. Presented at Digital Ancient Near Eastern Studies (DANES) Conference, Virtual, 4–6 December 2024.
- Heitz, C., Ismail-Meyer, K., Aellen, C., & **Roe**, J., Climate Change Resilience and Vulnerabilities of Waterfront Communities Mixed Methods Research on 'Pile Dwellings' around the Alps (4000–800 BCE). Presented at 30th Annual Meeting of the European Association of Archaeologists (EAA), Rome, 28–31 August 2024.
- Hinz, M. & Roe, J., ESTER: Estimation of the prehistoric population of Eurasia based on a large number of records. Presented at World Neolithic Congress, Şanlıurfa, 4–8th November 2024.
- Roe, J. & Hinz, M., Estimating the prevalance of post-agricultural population declines through the global radiocarbon record. Presented at World Neolithic Congress, Şanlıurfa, 4–8th November 2024.
- **Roe**, J. & Hinz, M., XRONOS: open chronometric data from archive to infrastructure. Presented at Digital Archaeology Bern 2023.
- Roe, J., Modelling the range of wild plants and crop progenitors in the Late Epipalaeolithic–Early Neolithic Levant. Presented at Digital Archaeology Bern Ancient West Asia.
- Roe, J., More than just porridge: old materialism and the macroarchaeology of the Neolithic Revolution. Presented at 13th International Congress on the Archaeology of the Ancient Near East, Copenhagen.
- Hinz, M. & Roe, J., Zoom and Enhance: high-resolution reconstruction of macroscale processes with Bayesian hierarchical models. Presented at European Association of Archaeologists (EAA) Annual Meeting, Budapest, 31 August 3 September.
- Roe, J., Are we what we eat? The Southwest Asian 'Neolithic Revolution' as macroarchaeological theory. Presented at the European Association of Archaeologists (EAA) Annual Meeting, Budapest, 31 August 3 September.
- Roe, J. & Hinz, M., XRONOS: challenges in building a global open repository for chronometric data. Presented at the European Association of Archaeologists (EAA) Annual Meeting, Budapest, 31 August 3 September.

2023

2022

- Roe, J., Out with the new, in with the old: recent advances in palaeoecological modelling with open data. Presented at the Association for Environmental Archaeology Spring Meeting 2021: Open Science Practices in Environmental Archaeology, Oxford.
- Roe, J., A revised radiocarbon chronology of Ganj Dareh. Presented at the 53rd Annual Meeting of the Canadian Archaeological Association, 'Ganj Dareh Then and Now: Integrating Past and Current Research'.
- Roe, J., Nonequilibrium dynamics in models of human palaeoecology. Presented at Computer Applications & Quantitative Methods in Archaeology (CAA), Limassol (Virtual).
- Batist, Z. & Roe, J., Open archaeology: a survey of collaborative software engineering in archaeological research. Presented at Computer Applications & Quantitative Methods in Archaeology (CAA), Limassol (Virtual).
- Roe, J., Computational models of chronology and regional settlement in the Epipalaeolithic–Neolithic Zagros (20000–6000 BP). Presented at the 'Revisiting the Hilly Flanks: the Epipalaeolithic and Neolithic periods in the eastern Fertile Crescent' conference, Copenhagen.
- Pedersen, P. N., **Roe**, **J.**, & Richter, T., Free foragers? A case for transient social inequality at Epipalaeolithic Shubayqa, eastern Jordan. Presented at the 12th International Congress on the Archaeology of the Ancient Near East, Bologna.
- Roe, J., On uncertain ground: modelling human palaeoecology in the Azraq basin, eastern Jordan, 24,000–8,000 BP. Presented at the 12th International Congress on the Archaeology of the Ancient Near East, Bologna.

- Roe, J., \*\*Gorram shiny!\* An accessible interface for reproducible landscape archaeology with R and fieldwalkr\*. Presented at Computer Applications & Quantitative Methods in Archaeology (CAA), Kraków.
- Richter, T., Arranz Otaegui, A., Jones, M., **Roe**, J., & Yeomans, L., Environmental Crisis and Societal Collapse: Was the Younger Dryas a significant factor in triggering the transition from the Palaeolithic to the Neolithic in the Levant?. Presented at 'Culture in Crisis: Flows of Peoples, Artifacts and Ideas', the 14th International Conference on the History and Archaeology of Jordan (ICHAJ 14), Florence.
- Arranz-Otaegui, A., Roe, J., Pantos, G. A., Santana, J., Araus-Cabrera, J. L., Le Roux, P., & Richter, T., Locally available or imported? Identifying the provenance of Natufian plant food and fuel resources at Shubayqa 1 (northeastern Jordan). Presented at the 18th conference of the International Workgroup for Palaeoethnobotany (IWGP), Lecce.
- Buffington, A., Olson, K., **Roe**, J., Al Kathiri, A. A., McCorriston, J., Over Mountains and Through Woods: survey results and preliminary spatial analysis of the 2018 field season of the Ancient Socio-Ecological Systems in Oman (ASOM) project. Presented at the 53rd Seminar for Arabian Studies, Leiden.
- Roe, J., & Richter, T., Mutable mobilities: 15,000 years of nomadic settlement in the Qa' Shubayqa, eastern Jordan. Presented at the 53rd Seminar for Arabian Studies, Leiden.
- Pantos, G. A., & **Roe**, **J**., A halfway house: open source tools for tidy photographic and 3D data management between the field and the archive. Presented at Computer Applications & Quantitative Methods in Archaeology (CAA), Kraków.
- Roe, J., The Q Continuum: open source GIS tools for paperless field survey.

  Presented at Computer Applications & Quantitative Methods in Archaeology (CAA), Kraków.
- Roe, J., Pedersen, P. N., Khosravi, S., A survey of early prehistoric sites in the Razavar Valley (Kermanshah, Iran). Presented at the British Association for Near Eastern Archaeology (BANEA) annual conference, Liverpool.
- **Roe**, **J**., Is there anything R can't do?. Presented at the Computer Applications and Quantitative Methods in Archaeology (CAA) conference, Tübingen.
- Roe, J., fieldwalkr. an R package for spatial sampling and field survey simulation. Presented at the Landscape Archaeology Conference (LAC), Newcastle & Durham.
- Richter, T., Arranz-Otaegui, A., Boaretto, E., Jones, M., **Roe**, J., & Yeomans, L., Reconstructing Environmental Impacts on Late Pleistocene and Early Holocene Societies in the Marginal Zone of the southern Levant: A Case Study from Shubayqa. Presented at the XVIII UISPP World Congress, Paris.
- Roe, J., The Zagros in Prehistory: geography, chronology, demography. Presented at the British Association for Near Eastern Archaeology (BANEA) annual conference, Liverpool, 2019, and the KU Archaeology Day.
- Martin, L. & Roe, J., The Complexities of Mammalian Body Size Change in Late Pleistocene to Holocene Southern Levant, 35 years on. Presented at 'From the Mediterranean to the Atlantic: themes in European zooarchaeology', Museum of Natural History and Science, Lisbon.
- **Roe**, J., A *greener* model of palaeoenvironments in the eastern Levant. Presented at Unravelling the Palaeolithic, Southhampton.

2018

2017

2016

2015		<ul> <li>Allentuck, A., Martin, L., Roe, J., Domestic maintenance practices in the Early Epipalaeolithic of the Jordanian steppe. Presented at the 12th International Symposium of the ICAZ Archaeozoology of Southwest Asia and Adjacent Areas Working Group (ASWA), Groningen.</li> <li>Roe, J. &amp; Martin, L., Open season: modelling prehistoric wildlife dynamics in Epipalaeolithic and Neolithic Jordan. Presented at the British Association for Near Eastern Archaeology (BANEA) annual conference, London.</li> <li>Allentuck, A., Roe, J., Martin, L., Macdonald, D., &amp; Maher, L., Zooarchaeological evidence for domestic maintenance in the Early Epipalaeolithic. Presented at the British Association for Near Eastern Archaeology (BANEA) annual conference, London.</li> </ul>
		Software & datasets
2023	•	rpaleoclim: R interface for paleoclimate data
2023	•	open-archaeo: a list of open source archaeological software and resources Zenodo
2022	•	era: R package for years with an era
2020	•	c14: R package for tidy radiocarbon data
2020	•	rintchron: R interface to IntChron

stratigraphr: R package for archaeological stratigraphy and

evoarchdata: datasets from studies of cultural evolution in

Data from Uerpmann 1987, The Ancient Distribution of Ungulate

fieldwalkr: R package for spatial sampling and survey simulation

chronological sequences

Mammals in the Middle East, TAVO A27

Trypillia mega-sites of the Ukraine

Archaeology Data Service

archaeology

Zenodo

2020

2020

2019

2019

2018

I am also an active contributor to a number of other open source software and open data projects.

# Field projects

2019 Field director **♀** Jordan Shubayqa Archaeological Project Field archaeologist 2018 Oman Ancient Socioecological Systems in Oman (ASOM) project Supervisor 2018 **♀** Iran Razavar Valley Survey Field archaeologist & supervisor 2018 Jordan Shubayqa Archaeological Project 2015 Field archaeologist 2015 Jordan Kharaneh IV Project Field archaeologist & supervisor 2014 • Ukraine Tripillia Mega-Sites Project 2012 Supervisor 2012 Bulgaria Mirkovo Project Trainee 2009 • Ukraine Tripillia Mega-Sites Project 2007 Trainee England York Archaeological Trust

In the field, I specialise in site prospection, intrasite survey, digital recording and GIS.

I was responsible for the survey component Shubayqa Archaeological Project (2018–2019), including designing the research strategy, planning and obtaining permits, and directing teams on the ground.

# Grants & scholarships

Young Researchers' Promotion Fund
And other internal funds

University of Bern

•

7300 CHF for 'Digital Archaeology Bern 2023'

•

Small grants for conference and workshop participation

2019 • Project grant

Danmarks Frie Forskningsfond

- "Connecting the Dots: Reconfiguring the Indo-European family tree"
- Named applicant. PI: Dr. Thomas Olander

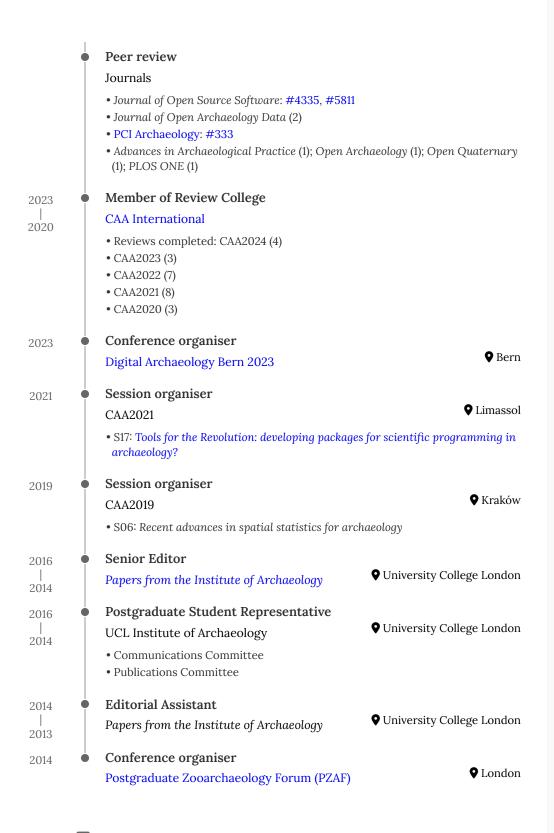


· Led workshop on "radiocarbon and aoristic modelling"

Promoting computational tools, and especially R, in archaeology has been a particular focus; I have experience in teaching at a range of levels, as well as informally mentoring students and colleagues.

Instructor 2024 University of Pisa "R for Archaeologists" winter school 2020 • For five years I have led an intensive two-day workshop on data visualisation in R for archaeologists Course lecturer 2023 • University of Bern Institute of Archaeological Sciences 2022 • Lead instructor on BA-/MA-level courses GIS in Archaeology and Statistical Methods for Archaeological Data Analysis (SMADA) • Recognised for "Excellence of Teaching" for SMADA 2023 (top 14% of courses in the Faculty of Humanities according to student satisfaction) Course lecturer 2021 Department of Cross-Cultural and Regional Studies 2018 University of Copenhagen • BA: "Practical Archaeology 1" (Arkæologisk praksis 1, HNAB0100FU), "Practical Archaeology 2" (Arkæologisk praksis 2, HNAB0102EU), "Science and Theory of Science" (Videnskabsteori, HTOR0102FU) • KA: "Theory and Method in Near Eastern Archaeology" (HNAK0101EU), "Environments and landscapes in the archaeological record of southwest Asia" (HNAB0102FU), "Neolithic to Early Urban Periods in the Near East" (HNAK0102EU), "Project-based course" (HNAK0100FU) Workshop organiser 2020 Department of Cross-Cultural and Regional Studies University of Copenhagen • Led an intensive two-day workshop on mobile GIS for linguistic field research Postgraduate Teaching Assistant 2016 University College London UCL Institute of Archaeology 2015 ARCL2028 Research & Presentation Skills **Tutor** 2016 Schools in London The Brilliant Club 2014 · Designed and delivered a university-style tutorial course for primary and high school students **Student Volunteer** 2015 • Petrie Museum of Egyptian Archaeology Maths and Archaeology workshop • Outreach event for high school students organised by Dr. Alice Stevenson (Petrie Museum) and Dr. Luciano Rila (UCL Mathematics) and supported by the London Mathematical Society





# Professional memberships





University of Nottingham

**Near East Climate Workshop** 

Workshop

2016

In my work with Wikipedia and other Wikimedia projects, I seek to promote engagement between academic archaeology and the free knowledge movement.

### • Software engineer

TPP SystmOne



 $\bullet$  Front-end and data migration programming for a large clinical systems developer, working with Java and SQL