

Ryan A. Manzuk, Ph.D.

Postdoctoral Research Associate

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EDUCATION AND PROFESSIONAL EXPERIENCE

2024 →	Princeton University , Princeton, NJ Postdoctoral Research Associate; Program on Science and Global Security Project focus: remote verification of uranium mining activities and environmental impacts
2018 - 2024	Princeton University , Princeton, NJ Ph.D., Geosciences; Advisor: Adam Maloof Thesis: Reading Earth's surface history from image archives
2016 - 2018	The Peace Corps , Guinea, West Africa Agroforestry Volunteer; Project focus: reforestation, beekeeping, and coffee cultivation
2012 - 2016	The University of Chicago , Chicago, IL B.S. with honor, Geophysical Sciences; Advisor: Mark Webster Thesis: Morphometric analysis of the Cambrian trilobite <i>Olenellus</i>

RESEARCH METHODS AND SKILLS

Field: Structure from motion 3D mapping using hand held and drone photography; grid-based mapping and sample collection in differential GPS geospatial framework; geologic mapping and section measurement with emphasis on sedimentology, stratigraphy, and paleontology.

Laboratory: 3D sample imaging and reconstruction via structure from motion, serial grinding and imaging, and X-ray Micro-CT; design and implementation of optics and imaging technologies; Computer Numerical Control and manual machining; morphometric analysis from 2D and 3D images; gas source isotope ratio mass spectrometry.

Programming and computing: Matlab; Python; C++; optical remote sensing; hyperspectral remote sensing; deep learning; machine learning; computer vision; QGIS; G-code; Dragonfly ORS; Avizo; L^AT_EX; HTML; CSS; Adobe Suite.

Languages: Superior ability in written and spoken French, as well as superior ability in Pular (a strictly verbal West African language), based upon Peace Corps implementation of ACTFL proficiency standards.

PEER REVIEWED PUBLICATIONS (*undergraduate student I mentored)

7. MANZUK, RYAN A., NADEAU, M. D., MATE, C., JACQUET, S. M., AND MALOOF, A. C.
Lithofacies vectors: Disentangling environmental variability, diagenesis, and secular change.
American Journal of Science (in review)
6. MANZUK, RYAN A., BIERI, R., ERDEN, B., SAMUELS, B. M., AND MALOOF, A. C.
A novel method for detecting agricultural land use change in Landsat imagery.
The Geographical Journal (submitted)
5. HOWES, B. J., MEHRA, A., WILCOTS, J., GEYMAN, E. C., MANZUK, RYAN A., DEUTSCH, C. A., AND MALOOF, A. C.
The where, when, and how of ooid formation: What ooids tell us about ancient seawater chemistry.
Earth and Planetary Science Letters 637 (2024), 118697 [PDF]
4. *PANIGRAHI, I., MANZUK, RYAN A., MALOOF, A. C., AND FONG, R.
Improving data-efficient fossil segmentation via model editing.
CVPR Workshop on Learning with Limited Labeled Data for Image and Video Understanding (L3D-IVU) (2023) [PDF]

3. **MANZUK, RYAN A.**, MALOOF, A. C., KAANDORP, J. A., AND WEBSTER, M.
Branching archaeocyaths as ecosystem engineers during the Cambrian radiation.
Geobiology 21, 1 (2023), 66–85 [PDF]
2. **MANZUK, RYAN A.**, *SINGH, D., MEHRA, A., GEYMAN, E. C., EDMONSOND, S., AND MALOOF, A. C.
A high-resolution, multispectral macro-imager for geology and paleontology.
GSA Today 32, 9 (September 2022), 4–9 [PDF]
1. MEHRA, A., HOWES, B. J., **MANZUK, RYAN A.**, SPATZIER, A., SAMUELS, B. M., AND MALOOF, A. C. A novel technique for producing three-dimensional data using serial sectioning and semi-automatic image classification.
Microscopy and Microanalysis (2022), 1–16 [PDF]

TEACHING

<i>Spring, 2023</i>	GEO 370 / ENV 370: <i>Sedimentology</i> [assistant] Data-focused explorations of the physical and chemical processes that shape Earth’s surface through the transport and deposition of sediments. Main Instructor: Adam Maloof
<i>Spring, 2022</i>	GEO 376 / ENV 375 / CEE 379 / MAE 376: <i>The Physics of Glaciers</i> [assistant] Physics-based modeling of glaciers and data analysis. Design of tank experiments for desktop glacier simulations. Main Instructors: Ching-Yao Lai and Adam Maloof
<i>Spring, 2021</i>	GEO 202: <i>Ocean, Atmosphere and Climate</i> [assistant] Introduction to gathering and analyzing Geoscience data including satellite imagery and float-based measurements. Main Instructor: Graeme MacGilchrist
<i>Fall, 2020</i>	ENV 367 / GEO 367: <i>Earth System Modeling, assessing mitigation strategies</i> [assistant] Forcing a compact Earth system model (OSCAR) and analyzing outputs in Python Jupyter notebooks. Main Instructor: Laure Resplandy
<i>Fall, 2019, 2020</i>	Junior Colloquium: <i>Princeton University Department of Geosciences</i> [main instructor] Basic skills in data analysis and computation using Python Jupyter notebooks.

FIELD EXPERIENCE

<i>2025</i>	Vienna, Paris, and Brussels, EU [2 weeks] Interviews with journalistic sources and agencies to inform uranium mine monitoring
<i>2023</i>	The Flinders Ranges, Australia [5 weeks] High-resolution mapping and sampling of Neoproterozoic and Cambrian paleoenvironments.
<i>2021</i>	Paradox Basin, Utah, USA [3 weeks] Searching for glacioeustasy in a tropical carbonate stratigraphy.
<i>2019</i>	The Pelly Mountains, Yukon Territory, Canada [6 weeks] Paleoenvironmental reconstruction of lower Cambrian archaeocyathid reefs.
<i>2019</i>	Bolivian Altiplano [6 weeks] Stratigraphic analysis of the environmental context surrounding the K-Pg mass extinction.
<i>2019</i>	Esmerelda County, Nevada, USA [4 weeks] Paleoenvironmental reconstruction of lower Cambrian archaeocyathid reefs.
<i>2018</i>	Zumaia, Spain and Gubbio, Italy [4 weeks] Stratigraphic context of potentially cyclic slope deposits near the K-Pg boundary.

SELECTED AWARDS, HONORS, AND FELLOWSHIPS

<i>2023-2024</i>	Myhrvold-Havranek Graduate Fellowship, Princeton University
<i>2019-2023</i>	Department of Geosciences Graduate Student Research Fund Princeton University [3×]
<i>2021</i>	Department of Geosciences Graduate Student Teaching Award, Princeton University
<i>2021</i>	Princeton Research Day Orange & Black Presenter Award, Princeton University
<i>2020</i>	Society for Sedimentary Geology Weimer Student Research Grant
<i>2018-2019</i>	David Elliston Guyer ’67 and Walter R.F. Guyer *41 Fellowship, Princeton University
<i>2016</i>	Mary Jean Mulvaney Scholar Athlete Award, The University of Chicago