

Education

- 2003 - 2009 **PhD, Geosciences and Astrobiology**, *Geosciences, Pennsylvania State University*
Dissertation ([link](#)): "Soil Formation and Terrestrial Biosignatures in the Middle Cambrian"
Advisors: Drs. Lee Kump and Tim White
- 1999 - 2003 **BA, Earth and Planetary Sciences**, *Earth & Planetary Sciences, Johns Hopkins University*
Thesis: "Heterogeneous Chemistry and Titan's Aerosols"
Advisor: Dr. Darrell Strobel

Professional Experience

- 2019 - Now **Founder**, *Science Voices*
- Building collaborations with overlooked communities to help them improve their science teaching resources (currently developing projects with colleagues in Ukraine, Brazil, and Indonesia)
- 2015 - 2018 **Instructional Designer Sr.**, *Center for Education Through eXploration, Arizona State Univ.*
- Led development and research of *Habitable Worlds* online science lab course
 - Co-developed Earth/political science *Build a Nation* course, hybrid and online versions
 - Developed collaborations for low-bandwidth digital science education projects
 - Developed grants and collaborations for place-based online geology experiences
- 2011 - 2015 **Course Coordinator**, *School of Earth & Space Exploration, Arizona State University*
- Led development and research of *Habitable Worlds*
- 2013 - 2014 **Consultant**, *Smart Sparrow LLC*
- Science advisor and designer for various astrobiology simulators

Grants and Fellowships

- 2020
- Fulbright Fellowship: "Enhancing Geoscience Education Through Digital Technologies" at Universitas Khairun, Ternate, Indonesia

Peer-Reviewed Publications

- In Prep
- **Horodyskyj, L. B.** and Lennon, T. "Engaging Political Science Students with Climate Science and its Consequences Through Data-Driven Roleplaying"
 - **Horodyskyj, L. B.**, Mead, C., and Anbar, A., "Informed Modifications in a Digital Science Course to Improve Course Outcomes"
 - **Horodyskyj, L. B.**, Mead, C., and Anbar, A., "Reformulating Philosophy of Science Teaching in Introductory Level Science Courses"
- 2019
- Pardos, Z. A. and **Horodyskyj, L. B.** "Analysis of Student Behavior in *Habitable Worlds* Using Continuous Representation Visualization." *Journal of Learning Analytics*, in press ([link](#))
- 2018
- Nawaz, S., Kennedy, G., Bailey, J., Mead, C., **Horodyskyj, L.** (2018). "Struggle Town? Developing profiles of student confusion in simulation-based learning environments." *Proceedings ASCILITE2018*, 224-233 ([link](#))
 - **Horodyskyj, L. B.**, Mead, C., Belinson, Z., Buxner, S., Semken, S., Anbar, A. D. (2018). "*Habitable Worlds*: Delivering on the Promises of Online Education." *Astrobiology*, **18(1)**: 86-99 ([link](#))
- 2017
- Perera, V., Mead, C., Buxner, S., **Horodyskyj, L. B.**, Semken, S., Lopatto, D., Anbar, A. "Students in fully online programs report more positive attitudes toward science than students in traditional,

in-person programs." *CBE–Life Sciences Education*, CBE – Life Sciences Education, 16(4): ar60 ([link](#))

- 2016 ● Domagal-Goldman, S. D., Wright, K. E., ..., **Horodyskyj, L. B.**, ..., Wong, T. (2016). "The Astrobiology Primer v2.0." *Astrobiology*, **16(8)**: 561-653 ([link](#))
- 2012 ● **Horodyskyj, L. B.**, White, T. S., Kump, L. R. (2012). "Substantial biologically mediated phosphorus depletion from the surface of a Middle Cambrian paleosol." *Geology*, **40(6)**: 503-506 ([link](#))

Smart Courses

- 2013 ● **Horodyskyj, L. B.** and Anbar, A. D., *Habitable Worlds* (version 2.0). Editor: Anbar, A. D. Tempe, Arizona: ASU Online
- 2011 ● **Horodyskyj, L. B.** and Anbar, A. D., *Habitable Worlds* (version 1.0). Editor: Anbar, A. D. Tempe, Arizona: ASU Online

Licenses

- 2015 - Now ● *Habitable Worlds* License and Distribution Agreement (Smart Sparrow's *Inspark Network*)

Pedagogical Portfolio

- 2016 - Now **Build-a-Nation**, with Dr. Tara Lennon (ASU School of Politics and Global Studies)
Transforms existing diplomacy course into a digital environment, tying nation building and diplomacy to a geography/geology-based world model ([demo](#))
- Developing digital world model and associated policy decision-making logic
 - Serving as liaison between course instructor and programmers for world model development
- 2010 - 2018 **Habitable Worlds**, with Dr. Ariel Anbar (ASU School of Earth & Space Exploration)
Fully interactive and adaptive online astrobiology lab science curriculum developed for Arizona State University with Smart Sparrow LLC technology ([select lesson demos](#))
- Designing, implementing, and analyzing novel online pedagogical approaches
 - Designing, integrating, and evaluating digital simulators for various astrobiology concepts
 - Developing new research tools for evaluating adaptive online science pedagogies
 - Coordinated ASU and Smart Sparrow teams when Smart Sparrow was located in Sydney, Australia
 - Taught or co-taught the course for most of its offerings between 2011 and 2015

Teaching Experience

- 2012 - 2014 **Faculty Associate**, Arizona State University
- 2018 ● GLG/SES 106: Habitable Worlds (~2000 students) – 4 offerings
- 2010 **Adjunct Faculty**, Glendale Community College
- Geology 110: Geologic Disasters and the Environment (~20 students) – 1 offering
- 2008 **Co-Instructor**, Pennsylvania State University
- Geosciences 21: Earth and Life (~60 students) – 1 offering
- 2003 - 2007 **Teaching Assistant**, Pennsylvania State University
- Geosciences 21: Earth and Life (~120 students) – 2 offerings
 - Geosciences 301: Environmental Geology (~60 students) – 1 offering
- 2000 - 2003 **Head Teaching Assistant**, Johns Hopkins University
- Computer Science 113: Internet (~700 students) – 9 offerings

Outreach Experience

- 2013 - Now **Panelist and Exhibitor, Phoenix Fan Fusion (formerly Phoenix Comicon)**
- Organizing and participating in 2-3 panels each year on topics from science to gaming to public policy
 - Organizing and displaying ASU educational projects
- 2014 - 2018 **Exhibitor, ASU Earth and Space Exploration Day, Night of the Open Door, SESE Open House**
- Organizing and displaying ASU ETX educational projects, astrobiology activities
- 2014 - 2015 **Science Programming Coordinator, Phoenix Comicon**
Science programming for pop culture event that regularly attracts 75,000+ attendees
- Recruited 100+ local and regional scientists and science outreach enthusiasts
 - Organized and scheduled 24+ hours of panels and exhibits each year
 - Networked with local science and technology organizations and companies
- 2013, 2016, 2019 **Grand Awards Judge, Intel International Science and Engineering Fair**
- 2012, 2016 **Special Awards Judge, Arizona Science and Engineering Fair**
- 2009 **Co-organizer, Earth System Science for Educators Workshop, North Carolina A&T State U.**
- Developed new digital plate tectonics and seismicity activities
- 2005 **Co-instructor, Summer Experience in Earth and Mineral Sciences Program, Penn State**
- Worked with disadvantaged middle school students on a research project of their own design

International Experience

Fieldwork	Western Australia (Shark Bay, Karijini National Park)
Conferences and Workshops	International Astrobiology Education (Höör, Sweden), Sustainability Workshop (Jakarta, Indonesia), Earth-Life Science Institute Winter School (Tokyo, Japan), International Geoscience Education (Campinas, Brazil)
Ed-Tech Collaborations	Smart Sparrow (Sydney, Australia)
Independent Travel	Europe (UK, France, Monaco, Switzerland, Liechtenstein, Germany, Austria, Czech Republic, Slovakia, Poland, Ukraine, Hungary, Romania, Bulgaria, Greece, Italy, Spain); Asia (Nepal, Japan, India, Indonesia); Africa (Tunisia); Oceania (Australia); South America (Brazil)

Technical Skills

Learning Platforms	Smart Sparrow's Adaptive e-Learning Platform (AeLP)
Discussion Platforms	Piazza
Learning Management	Blackboard, Canvas
Media Software	Adobe Creative Suite, iMovie, Screenflow
Research Software	SPSS Statistics
Computer Languages	HTML, PHP, JavaScript, Java, Fortran 90
Databases	MySQL
Languages	Fluent: English, Ukrainian Conversational: Indonesian, French, German

Research Skills

Field Work	Outcrop measuring, description, sampling
Sample Preparation	Rock saw, ball mill grinding, acid digestions (HCl, HF), lithium metaborate fusions for oxide analysis, clean techniques for low carbon samples
Instrumentation	Elemental analyzer (CE Instruments NA 2500) use and maintenance, x-ray diffraction (Rigaku microdiffractometer); x-ray mapping (Horiba XGT-5000)
Pedagogy	Study design, data analysis

Memberships

2018 - Now	European Geosciences Union
2017 - Now	American Indian/Alaskan Native Working Group (NASA Science Mission Directorate)
2009 - Now	National Association of Geoscience Teachers
2008 - Now	American Geophysical Union
2006 - Now	Geological Society of America

Professional Development

2018	Earth-Life Science Institute Origins Network Winter School (Tokyo Institute of Technology)
2017	Urban Heat Resilience Storytelling Workshop (Asian Cities Climate Change Resilience Network, Mercy Corps Indonesia, Thomson Reuters Foundation)
2017	Engaging Alaska Youth in STEM and Community Resilience Workshop (University of Alaska, Fairbanks/NOAA)
2010	Sagan Exoplanet Summer Workshop (CalTech)
2008	NASA Planetary Science Summer School, Session 2 (CalTech/Jet Propulsion Lab)

Invited Colloquia and Public Talks

2019	<ul style="list-style-type: none"> • "Alternative Ed: Rethinking Science Education for the Anthropocene." University of the Virgin Islands, US Virgin Islands (July)
2018	<ul style="list-style-type: none"> • "Alternative Ed: Rethinking Science Education for the Anthropocene." Oakland University, MI (November) • "Alternative Ed: Rethinking Science Education for the Anthropocene." Southern Illinois University, Carbondale, IL (November) • "Using Big Questions, Technology, and Comedy to Drive Student Learning." <i>Serious Play Conference</i>, Manassas, VA (July) • "Alternative Ed: Rethinking Science Education for the 21st Century." Colgate University, Hamilton, NY (February)

Workshops

2018	<ul style="list-style-type: none"> • "Active Learning and Digital Geoscience Education." <i>Fall Meeting of the Geological Society of America</i>, Indianapolis, IN (November) • "Plugging in to 21st Century Geoscience Education." <i>VIII GeoSciEd</i>, Campinas, Brazil (July)
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Conferences

- 2019
- **Horodyskyj, L. B.**, Mead, C., Oliver, C., Anbar, A. D. "Teaching Real Science: A Novel Approach to Teaching Students the Scientific Process." *Astrobiology Science Conference*, Seattle, WA (June)
 - **Horodyskyj, L. B.**, Mead, C., Oliver, C., Anbar, A. D. "Teaching Real Science: A Novel Approach to Engaging Students in the Scientific Process." *European Geosciences Union General Assembly*, Vienna, Austria (April)
- 2018
- **Horodyskyj, L. B.**, Bruce, G., Semken, S., Anbar, A. D., Hosman, L. "Online Geoscience Offline." *Fall Meeting of the American Geophysical Union*, Washington, DC (December)
 - **Horodyskyj, L. B.**, Mead, C., Pardos, Z., Anbar, A. D. "Improving Student Outcomes Through Informed Use of Learning Analytics." *Fall Meeting of the American Geophysical Union*, Washington, DC (December)
 - **Horodyskyj, L. B.**, Bruce, G., Bratton III, D., Mead, C., Ruberto, T., Semken, S., Anbar, A. D. "Education Through Exploration: Lessons from Digital Active Learning at Scale." *Fall Meeting of the Geological Society of America*, Indianapolis, IN (November).
 - **Horodyskyj, L. B.**, Mead, C., Lennon, T. "Build a Catastrophe: Using Digital World and Policy Models to Engage Political Science Students with Climate Change." *Fall Meeting of the Geological Society of America*, Indianapolis, IN (November).
- 2017
- **Horodyskyj, L. B.**, Lennon, T., Mead, C., Anbar, A. "Build a Catastrophe: Using Digital World and Policy Models to Engage Political Science Students with Climate Change." *Fall Meeting of the American Geophysical Union*, New Orleans, LA (December).
 - **Horodyskyj, L. B.**, Mead, C., Anbar, A. D. "Finding Actionable Data to Support Student Success in Introductory Science Courses." *Fall Meeting of the American Geophysical Union*, New Orleans, LA (December). *invited*
 - Perry, A., Seyffer, L., **Horodyskyj, L. B.**, Hosman, L., McAllister, L. "Challenges and Opportunities for Delivering and Using Open Access Materials in Developing Countries." *Open Education 2017*, Anaheim, CA (October).
 - **Horodyskyj, L. B.**, Bruce, G., McAllister, L., Semken, S., Anbar, A., Hosman, L. "Online Geoscience Offline." *Goldschmidt*, Paris, France (August).
 - **Horodyskyj, L. B.**, Mead, C., Anbar, A. D. "I Assumed You Knew: Teaching Assumptions as Co-Equal to Observations in Scientific Work." *Astrobiology Science Conference*, Mesa, AZ (April).
- 2016
- **Horodyskyj, L. B.**, Mead, C., Anbar, A. D. "I Assumed You Knew: Teaching Assumptions as Co-Equal to Observations in Scientific Work." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December).
 - **Horodyskyj, L. B.**, Mead, C., Buxner, S. R., Semken, S. C., Anbar, A. D. "Assessing Complex Learning Objectives through Analytics." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December).
- 2015
- **Horodyskyj, L. B.**, Mead, C., Buxner, S. R., Semken, S. C., Anbar, A. D. "Data-Driven Design: Learning from Student Experiences and Behaviors." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December).
 - **Horodyskyj, L. B.** "Crucible of Creativity: Testing Public Outreach Activities at the Phoenix Comicon." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December). *invited*
 - **Horodyskyj, L. B.**, Buxner, S., Schönstein, D., Semken, S., Anbar, A. D. "Increasing the Impact of Coursework Through Deep Analytics." *Astrobiology Science Conference*, Chicago, IL (June).
 - **Horodyskyj, L. B.**, Schönstein, D., Buxner, S. R., Semken, S. C., Anbar, A. D. "Developing and Implementing Instruments for Measuring Scientific Reasoning Abilities using Online Intelligent Tutoring Systems." *American Geophysical Union Joint Assembly Meeting*, Montreal, Canada (May).
 - **Horodyskyj, L. B.** "Science at Phoenix Comicon: Connecting with a Science-Attuned Audience." *American Geophysical Union Joint Assembly Meeting*, Montreal, Canada (May). *invited*

- 2014
- **Horodyskyj, L. B.**, Schönstein, D., Buxner, S. R., Semken, S. C., Anbar, A. D. "Increasing Impact of Coursework Through Deep Analytics." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December).
 - **Horodyskyj, L. B.**, Walker, S. I., Forrester, J. H. "Outreach Opportunities for Early Career Scientists at the Phoenix Comicon." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December).
 - **Horodyskyj, L. B.**, Buxner, S. R., Ben-Naim, D., Semken, S. C., Anbar, A. D. "Transforming the Online Course." *258th American Chemical Society National Meeting*, San Francisco, CA (August)
 - **Horodyskyj, L. B.**, Buxner, S. R., Semken, S. C., Anbar, A. D. "Online Classrooms: Powerful Tools for Rapid-Iteration Pedagogical Improvements." *Astronomical Society of the Pacific 2014 Annual Meeting*, Burlingame, CA (August).
 - **Horodyskyj, L. B.**, Buxner, S. R., Ben-Naim, D., Semken, S. C., Anbar, A. D. "Transforming the Online Classroom via an Innovative Astrobiology Course." *45th Lunar and Planetary Science Conference*, Woodlands, TX (March).
- 2013
- **Horodyskyj, L. B.**, Ben-Naim, D., Semken, S. C., Anbar, A. D. "Transforming the Online Course." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December).
 - **Horodyskyj, L. B.**, Anbar, A. D. "Habitable Worlds: New Approaches to Online Education." *1st International Workshop on Education in Astrobiology*, Höör, Sweden (June).
- 2012
- **Horodyskyj, L. B.**, Ben-Naim, D., Semken, S. C., Anbar, A. D. "Hunting for Habitable Worlds: Engaging Students in an Adaptive Online Setting." *Astrobiology Science Conference*, Atlanta, GA (April).
- 2011
- **Horodyskyj, L. B.**, Ben-Naim, D., Anbar, A. D., Semken, S. C. "Hunting for Habitable Worlds: Engaging Students in an Adaptive Online Setting." *Fall Meeting of the American Geophysical Union*, San Francisco, CA (December).

Media Coverage

- 2017
- *The Chronicle of Higher Education* (2017, October 22), "Designing an Online Science Course With Video-Game Appeal" (<https://www.chronicle.com/article/Ariel-Anbar-Designs-Online/241480>)
- 2015
- *Scientific American* (2015, January 21), "Astrobiologist Aims to Make Science Education More Interactive" (<https://blogs.scientificamerican.com/observations/astrobiologist-aims-to-make-science-education-more-interactive/>)
- 2013
- *e-Literate* (2013, March 3), "The OpenClass Vision: An Example" (<https://mfeldstein.com/the-openclass-vision-an-example/>)