Elizabeth C. Koeman-Shields

Angelo State University
Department of Physics and Geosciences ASU
Station #10904, San Angelo, TX 76909
325-486-6767
ekoemanshields@angelo.edu
www.elizabethckoemanshields.com

EDUCATION

Ph.D. in Geology **August 2015**
University of Notre Dame **Notre Dame, IN**
Department of Civil & Environmental Engineering & Earth Sciences
Dissertation: *Multi-Scale Separation and Analysis of Heterogeneous Trinitite Glass Phases*
Advisor: Dr. Antonio Simonetti

B.S. in Geology **May 2011**
Grand Valley State University **Allendale, MI**
Department of Geology
Thesis: *Carbon Storage in Alluvial Sediment and Land-Use Erosional Effects*
Advisor: Dr. Patricia Videtich

PROFESSIONAL APPOINTMENTS

Visiting Assistant Professor **2018-2019**
Angelo State University **San Angelo, TX**
Department of Physics and Geosciences

Postdoctoral Researcher **2015-2018**
University of Hawai‘i at Mānoa **Honolulu, HI**
Hawai‘i Institute of Geophysics and Planetology
Project: *Investigating Elemental and Isotopic Composition of Solar Wind in Genesis Collectors*
Advisor: Dr. Gary Huss

TEACHING AND MENTORING EXPERIENCE

Instructor – Physical Geology (GEOL 1403), Angelo State University 2018
Three lecture and three laboratory sections. Responsible for creating course material, giving lectures, developing in-class activities and demonstrations, grading of homework assignments, exams, and projects, holding office hours

Co-Instructor – Solar System Studio (GG 107), University of Hawai‘i 2018
Responsible for giving lectures, developing in-class activities and demonstrations, grading of homework assignments and projects, holding office hours

Research Mentor, High School Student Research (two students) 2017-2018
Met monthly to discuss progress, assisted in collecting and analyzing data, aid with writing and presenting data

Research Advisor, Undergraduate Research, University of Notre Dame 2012-2015
Advised summer research projects for nine undergraduates over the course of three years, including instruments training and assisted with data collection and analysis

Research Mentor, High School Student Research 2012-2014

Met weekly to collect, analyze, and discuss data. Student was a finalist of 2014 Northern Indiana Regional Science and Engineering Fair

Teaching Assistant – Geology Field Camp, University of Notre Dame 2014
Assisted with one-week field camp activities and lectures in the field (Death Valley, CA)

Laboratory Instructor – Planet Earth, University of Notre Dame 2013
Led weekly 2 hour lab section for 18-24 students, held study sessions, graded lab assignments and exams

Teaching Assistant – Engineering Geology, University of Notre Dame 2012-2013
Assisted with in-class labs and demonstrations, graded homework and exams

Laboratory Instructor – Introductory Geology, University of Notre Dame 2011-2012
Led weekly 2 hour lab section for 18-24 students, graded lab assignments and exams

PUBLICATIONS AND PRESENTATIONS *(*denotes undergraduate co-authors)*

Publications

Huss GR, **Koeman-Shields EC**, Jurewicz AJG, Burnette DS, Nagashima K, Ogliore RC, Olinger CT (in preparation). Hydrogen fluence in Genesis collectors: Implications for acceleration of solar wind and for solar metallicity.

Laming JM, Heber VS, Burnett DS, Guan Y, Hervig R, Huss GR, Jurewicz AJG, **Koeman-Shields EC**, McKeegan KD, Nittler L, Reisenfeld D, Rieck KD, Wang J, Wiens RC, Woolum DS (in press). Determining the elemental and isotopic composition of the presolar nebula from Genesis data analysis: The case of Oxygen. The Astrophysical Journal Letters.

Koeman EC, McNamara BK, Smith FN, Simonetti A, Burns PC (2017). Developing methodologies for source attribution: Glass phase separation in Trinitite using NF_3. *Radiochimica Acta*, 105(5): 417-430.

Dustin MK*, **Koeman EC**, Simonetti A, Torrano Z*, Burns PC (2016). Comparative investigation between in-situ laser ablation- vs. bulk sample (solution mode)-ICP-MS analysis of Trinitite post-detonation materials. *Applied Spectroscopy*, 70: 1446-1445.

Koeman EC, Simonetti A, Burns PC (2015). Sourcing of copper and lead within red inclusions from Trinitite post detonation material, *Analytical Chemistry*, 87: 5380-5386.

Donohue PH, Simonetti A, **Koeman EC**, Mana S, Burns PC (2015). Nuclear forensic applications involving high spatial resolution analysis of Trinitite cross-sections. *Journal of Radioanalytical and Nuclear Chemistry*, 306: 457-467.

Bellucci JJ, Simonetti A, **Koeman EC**, Wallace C, Burns PC (2014). A Detailed Geochemical Investigation of Post Nuclear Detonation Trinitite Glass at High Spatial Resolution: Delineating Anthropogenic vs. Natural Components. *Chemical Geology*, 365: 69-86.

Koeman EC, Simonetti A, Chen W, Burns PC (2013). Oxygen isotope composition of trinitite post detonation materials. *Analytical Chemistry*, 85: 11913-11919.

Bellucci JJ, Simonetti A, Wallace C, **Koeman EC**, Burns PC (2013). The Pb Isotopic Composition of Trinitite Melt Glass: Evidence for the Presence of Canadian Industrial Pb in the First Atomic Weapon Test. *Analytical Chemistry*, 85: 7588-7593.

Simonetti A, Bellucci JJ, Wallace C, **Koeman EC**, Burns PC (2013). Nonproliferation and nuclear forensics: Detailed, multi-analytical investigation of trinitite post-detonation materials. *2013 Mineralogical Association of Canada Short Course Se*ries, Volume 43: 395-416.

Wallace C, Bellucci JJ, Simonetti A, Hainley T*, **Koeman EC**, Burns PC (2013). A multi-method approach for determination of radionuclide distribution in trinitite. *Journal of Radioanalytical and Nuclear Chemistry*, 298: 993-1003.

Bellucci JJ, Simonetti A, Wallace C, **Koeman EC**, Burns PC (2013). Isotopic Fingerprinting of the World's First Nuclear Device Using Post-Detonation Materials. *Analytical Chemistry*, 85: 4195-4198.

Bellucci JJ, Wallace C, **Koeman EC**, Simonetti A, Burns PC, Kieser J, Port E, Walczak T (2012). Distribution and Behavior of Some Radionuclides Associated with the Trinity Nuclear Test. *Journal of Radioanalytical and Nuclear Chemistry*, 295: 2049-2057.

Selected Conference Presentations (can provide full list at request)

Koeman-Shields EC, Huss GR, Westphal AJ, Ogliore RC, Jurewicz AJG, Burnett DS, Nagashima K, (2018) Measuring magnesium isotopes in Genesis silicon detectors using Rastered ion imaging. 49th Lunar and Planetary Science Conference, Houston, TX

Koeman-Shields EC, Huss GR, Jurewicz AJG (2017). SIMS measurements of H in DOS Genesis collectors: Differences in physical properties of the collectors affect the results. 80th Annual Meeting of the Meteoritical Society, Santa Fe, NM.

Koeman-Shields EC, Huss GR, Westphal AJ, Ogliore RC, Jurewicz AJG, Burnett DS, Nagashima K, (2017) Investigating the impact of solar wind hydrogen on the measurement of solar wind magnesium. 48th Lunar and Planetary Science Conference, Houston, TX

Koeman-Shields EC, Huss GR, Ogliore RC, Jurewicz AJG, Burnett DS, Nagashima K, Olinger CT, (2016) Hydrogen fluence calculated from Genesis collectors. 47th Lunar and Planetary Science Conference, Houston, TX

*Hurley PE, *Wunderlich S, Donohue PH, **Koeman EC**, Simonetti A, (2014) Determining the origin of anthropogenic inclusions in Trinitite glass using isotopic compositions. Geological Society of America Annual Meeting, Vancouver, BC, Canada

Koeman EC, Simonetti A, Burns PC, (2014) Methodologies for source attribution using copper and lead within red inclusions of Trinitite. Geological Society of America Annual Meeting, Vancouver, BC, Canada

Koeman EC, McNamara BK, Smith FN, Mana S, Donohue P, Simonetti A, Burns PC, (2014) Separation of glass phases within Trinitite using NF_3: Developing methodologies for source attribution. Geological Society of America Annual Meeting, Vancouver, BC, Canada

*Krug M, *Thomas RL, *Torrano Z, *Cook N, **Koeman EC**, Simonetti A, (2013) Forensic analysis of Trinitite post-detonation materials at high spatial resolution: Developing methods for source attribution. Geological Society of America Annual Meeting, Vancouver, BC, Canada

Koeman EC, Simonetti A, Bellucci J, Wallace C, Burns PC, (2013) Deciphering the origin of red inclusions using *in-situ* chemical and isotopic (Pb & U) evidences. Joint Annual Meeting of the Geological Association of Canada and Mineralogical Association of Canada, Winnipeg, MB, Canada

Koeman EC, Wallace CM, Simonetti A, (2012) 3-dimensional distribution of chemical constituents of Trinitite. Ninth International Conference on Methods and Applications of Radioanalytical Chemistry (MARC IX), Kailua-Kona, Hawai'i, USA

Koeman EC, Walters KA, Colgan, PM, (2010) The impact of land-use changes on carbon storage in small streams, Ottawa County, Michigan, Geological Society of America Annual Meeting, Denver, CO

Guest Lectures

Guest Lecturer, Voyage Through the Solar System (GG 105), *University of Hawai'i,* "Space Junk: Asteroids, Meteorites, and Comets", Fall Semester 2017

Invited Speaker, Earth Science Week, *Grand Valley State University,* "Trinitite: A Geological Clue Used to Unravel Mysteries in Nuclear Forensics", October 6, 2014

AWARDS, SERVICE AND CAREER DEVELOPMENT

Awards

Alternate Sponsored Fellowship, Pacific Northwest National Laboratory, Office of Science & Engineering Education (*Summer 2014*)

Graduate Research Grant, Geological Society of America (*Spring 2014*)

Undergraduate Research Fellowship, NASA Michigan Space Grant Consortium (*2010*)

Service

Workshop Leader, Expanding Your Horizons Hawai'i, S.T.E.M. Workshops for Middle School Girls, University of Hawai'i, Honolulu, HI (*2018*)

Volunteer Mentor, HI STAR Summer Research Program for local high school students, University of Hawai'i, Honolulu, HI (*2017*)

Volunteer, Mini-Meteorite Lab for Open House at the School of Ocean Science and Earth Science and Technology, University of Hawai'i, Honolulu, HI (*2015 & 2017*)

Volunteer Judge, GSA Stephen E. Dwornik Student Awards for undergraduate and graduate presentations, *The Lunar and Planetary Science Conference 48th Annual Meeting* (*2017)*

Volunteer Judge, McKay-Wiley Student Awards for graduate presentations, *The Meteoritical Society 79th Annual Meeting* (*2016)*

Volunteer Judge, high school student presentations, *Northern Indiana Regional Science and Engineering Fair,* South Bend, IN (*2013 & 2014*)

Geology Merit Badge Workshop Volunteer, *Boy Scouts of America, Council #781,* Allendale, MI (*2011*)

Career Development

"ISEE Professional Development Program," Institute for Scientist & Engineer Educators, University of California Santa Cruz (2018)

"Striving for Excellence in Teaching," Kaneb Center for Teaching and Learning, University of Notre Dame (*2012-2014*)

INSTRUMENTATION EXPERIENCE

Scanning Electron Microscopy (7 years)
Inductively Coupled Plasma-Mass Spectrometer (ICP-MS; solution and laser-ablation) (4 years)
Secondary Ion Mass Spectrometry (3 years)
Electron Microprobe (3 years)
Micro X-Ray Fluorescence (3 years)
Laser fluorination combined with stable C and O isotope analysis (3 years)
Gamma Spectroscopy (2 years)
Single Crystal and Powder X-Ray Diffraction (1 year)
Transmission Electron Microscopy (6 months)
Focused Ion Beam (6 months)