

# Kyle Uckert

## Education

- 2013 – 2016 **Doctor of Philosophy (PH.D.) in Astronomy, Minor in Electrical & Computer Engineering, New Mexico State University, Las Cruces, NM.**  
Dissertation: The Optimization of *in situ* Astrobiology Instrumentation Techniques for Biosignature Identification on Planetary Surfaces  
Advisor: Dr. Nancy Chanover
- 2010 – 2013 **Master of Science (M.S.) in Astronomy, Minor in Electrical & Computer Engineering, New Mexico State University, Las Cruces, NM.**  
Advisor: Dr. Nancy Chanover
- 2006 – 2010 **Bachelor of Science (B.S.) in Astrophysics, Minor in Mathematics, Ohio University: Honors Tutorial College, Athens, OH.**  
Undergraduate Thesis: High Temperature Resistivity and Hall Effect Measurements of Conductive and Semiconductive Thin Films  
Advisor: Dr. Martin Kordesch

## Research Experience

- 2017 – **Developing a Scientific Instrument Package for the LEMUR Rock-Climbing Robot, Jet Propulsion Laboratory, Pasadena, CA.**  
I am contributing to the development of an instrument payload for the LEMUR rock-climbing robot, to include an IR spectrometer, a Raman spectrometer, and an XRF spectrometer. Each of these tools produces a dataset unique in characterizing the mineralogy and presence of biosignatures in field samples.  
Group Leader: Dr. Aaron Parness
- 2013 – 2016 **Optimizing a two-step laser time-of-flight mass spectrometer for in situ astrobiology investigations, NASA Goddard Space Flight Center, Greenbelt, MD.**  
I was involved with the optimization of a two-step laser desorption time-of-flight (LD-TOF) mass spectrometer (L2MS) for biosignature detection in synthetic and naturally occurring planetary analog samples.  
Advisor: Dr. Stephanie Getty
- 2011 – 2016 **Characterization of biomarkers within geologic samples analyzed using in situ spectroscopy techniques, New Mexico State University, Las Cruces, NM.**  
I have investigated the biosignature detection capabilities of several *in situ* techniques including: an LD-TOF mass spectrometer, an acousto-optic tunable filter (AOTF) IR point spectrometer, a laser-induced breakdown spectrometer (LIBS), X-ray diffraction (XRD) / X-ray fluorescence (XRF), and scanning electron microscopy (SEM) / energy dispersive X-Ray spectroscopy (EDS).  
Advisor: Dr. Nancy Chanover
- 2010 – 2013 **An analysis of a stellar occultation by Neptune, New Mexico State University, Las Cruces, NM.**  
I extracted physical atmospheric parameters from a 2008 stellar occultation and compared long baseline stratospheric temperatures with previously published results to determine the cause of the observed variability.  
Advisor: Dr. Nancy Chanover

- 2011 – 2012 **An evaluation of the James Webb Space Telescope for Ice Giant observations**, *New Mexico State University*, Las Cruces, NM.  
I used published IR spectra of the Ice Giants to determine the capabilities of observing these bodies with the JWST.  
Advisor: Dr. Nancy Chanover
- 2011 – 2012 **Restoration and robotization of the Tortugas Mountain Observatory**, *New Mexico State University*, Las Cruces, NM.  
I assisted in the installation of hardware for remote operations, and configuration and testing of software to prepare for robotization efforts.  
Advisor: Dr. Jon Holtzman
- 2009 – 2010 **High temperature conductance and Hall Effect measurements of thin films with an emphasis on Sc<sub>2</sub>O<sub>3</sub>**, *Ohio University*, Athens, OH.  
I designed and constructed an apparatus to measure the Hall Effect on semi-conductive thin films at high temperatures.  
Advisor: Dr. Martin Kordesch
- 2008 – 2009 **The effect of thermal conductivity and radiation-recoil on the rotation rates of near-earth-asteroids (NEAs)**, *Ohio University*, Athens, OH.  
I developed code in FORTRAN and IDL to determine the effect thermal conductivity has on the YORP effect on NEAs.  
Advisor: Dr. Thomas Statler

## Work Experience

- 2017 – **JPL Postdoctoral Scholar**, *Caltech*, Pasadena, CA.  
Developing a Scientific Instrument Package for the LEMUR Rock-Climbing Robot
- 2013 – 2016 **NASA Space Technology Research Fellow**, *New Mexico State University*, Las Cruces, NM.  
Optimizing a two-step laser time-of-flight mass spectrometer for in situ astrobiology investigations
- 2010 – 2012 **Teaching Assistant**, *New Mexico State University*, Las Cruces, NM.  
Responsible for grading homework and exams and for lab component of astronomy courses: ASTR 105, ASTR 305
- 2009 – 2010 **Teaching Assistant**, *Ohio University*, Athens, OH.  
Responsible for lab component of physics courses: PHYS 201, PHYS 202, PHYS 253
- 2008 – 2010 **Library Tutoring Services**, *Ohio University*, Athens, OH.  
Tutoring students, primarily assisting with homework and exam preparation: PHYS 201, PHYS 202, PHYS 251, PHYS 252, PHYS 253, MATH 263(ABCD), MATH 340

## Honors and Awards

- December 2016 **Fall 2016 Outstanding Graduate Award for Graduate School, Ph.D.**, *New Mexico State University Alumni Association*, Las Cruces, NM.  
This award is presented to a single graduating PhD student each semester who demonstrates an excellence in scholarship and participates in leadership roles in the university and community.
- July 2016 **Lewis and Clark Fund for Exploration and Field Research in Astrobiology**, *American Philosophical Society*, Philadelphia, PA.  
The NASA Astrobiology Institute-supported Lewis and Clark Fund for Exploration and Field Research in Astrobiology awards students and early career scientists actively participating in astrobiology field work. This grant will support an investigation that I will lead to Fort Stanton Cave to study manganese oxide residue.
- October 2015 **Barry Neil Rappaport Endowed Memorial Scholarship Award**, *New Mexico State University*, Las Cruces, NM.  
The Rappaport Award recognizes a strong research effort in astronomy and an exceptional record of public outreach and service over the time a graduate student has been at NMSU.

- May 2014 **A. Scott Murrell Memorial Endowed Scholarship**, *New Mexico State University*, Las Cruces, NM.  
The Murrell Award recognizes outstanding research or professional development, and related accomplishments that raise the visibility of the NMSU Astronomy Department.
- April 2014 **College of Arts & Sciences 3 Minute Thesis Competition: 1st Place**, *New Mexico State University*, Las Cruces, NM.  
An academic competition to present your thesis to the public in three minutes.
- 2013 – 2016 **NASA Space Technology Research Fellowship**, *New Mexico State University*, Las Cruces, NM.  
Project title: Optimizing a Two-Step Laser Time-of-Flight Mass Spectrometer for In Situ Astrobiology Investigations.  
A fellowship award to fund graduate dissertation research that contributes to NASA's goal of creating innovative new space technologies for our Nation's science, exploration, and economic future in collaboration with a NASA center.
- May 2010 **10th Annual Research and Creativity Expo: Physics and Astronomy: 1st Place**, *Ohio University*, Athens, Ohio.  
Project Title: High Temperature Resistivity and Hall Effect Measurements of Semiconducting Thin Films
- April 2010 **SPS 1st Annual Undergraduate Research Conference 2010: 1st Place**, *Ohio University*, Athens, OH.  
Project Title: High Temperature Resistivity and Hall Effect Measurements of Semiconducting Thin Films.
- 2010 **LeRoy Apker Award Nomination**, *Ohio University*, Athens, OH.  
To recognize outstanding achievements in physics by undergraduate students who have demonstrated great potential for future scientific accomplishment.
- 2010 **Inducted into Physics Honorary Society: Sigma Pi Sigma ( $\Sigma\Pi\Sigma$ )**, *Ohio University*, Athens, OH.  
A society to honor outstanding scholarship in physics, to encourage interest in physics among students at all levels, to promote an attitude of service, and to provide a fellowship of persons who have excelled in physics.
- 2009 – 2010 **The Jerry and Karen Adams Scholarship**, *Ohio University*, Athens, OH.  
A scholarship awarded to students studying fine arts or physics with a cumulative 3.5 GPA.
- 2008 – 2010 **C. Paul and Beth K. Stocker Scholarship**, *Ohio University*, Athens, OH.  
A scholarship awarded to students studying botany, chemistry, mathematics, physics, zoology or geology in good academic standing and personal achievement.
- 2006 – 2010 **Gateway Scholarship**, *Ohio University*, Athens, OH.  
A scholarship awarded to students in good academic standing with strong standardized test scores.
- 2006 – 2010 **Gateway Trustee Award**, *Ohio University*, Athens, OH.  
A scholarship awarded to students in good academic standing with strong standardized test scores.
- 2006 – 2010 **Vision Ohio - Honors Tutorial College Award**, *Ohio University*, Athens, OH.  
A scholarship awarded to Honors Tutorial College students in good academic standing with strong standardized test scores.
- 2006 – 2009 **James T. Shipman Scholar**, *Ohio University*, Athens, OH.  
A scholarship awarded to students studying physics in good academic standing, selected by the Department of Physics and Astronomy.

## Publications

### Peer-Reviewed Publications

*under review* K. Uckert, S. Getty, A. Grubisec, X. Li, W. B. Brinckerhoff, N. J. Chanover. IR Resonance Enhanced Organic Detection with a Two-Step Laser Desorption Time-of-Flight Mass Spectrometer. *Icarus*, *In Preparation*.

- under review* [K. Uckert](#), N. J. Chanover, S. Getty, D. G. Voelz, W. B. Brinckerhoff, N. McMillan, X. Xiao, P. J. Boston, X. Li, A. McAdam, D. A. Glenar, A. Chavez. The Characterization of Biosignatures in Caves using a suite of in situ Instruments I: Calcium Carbonate. *Astrobiology*, *Submitted*.
- under review* [K. Uckert](#), N. J. Chanover, S. Getty, D. G. Voelz, W. B. Brinckerhoff, N. McMillan, X. Xiao, P. J. Boston, X. Li, A. McAdam, D. A. Glenar, A. Chavez. The Characterization of Biosignatures in Caves using a suite of in situ Instruments II: Gypsum, Mn Oxide, & Sulfur. *Astrobiology*, *Submitted*.
- 2015 [K. Uckert](#), N. J. Chanover, D. G. Voelz, X. Xiao, P. J. Boston, D. A. Glenar. Demonstration of a portable AOTF IR spectrometer for *in situ* exploration of planetary surfaces. *Aerospace Conference, 2015 IEEE*, pp 1–9, March 2015.
- 2015 X. Li, [K. Uckert](#), S. Getty, A. Grubisic, W. Brinckerhoff, T. Cornish, S. Ecelberger, N. Chanover. Analysis of aqueous environments by laser desorption/ionization time-of-flight mass spectrometry. *Aerospace Conference, 2015 IEEE*, pp 1–10, March 2015.
- 2014 [K. Uckert](#), N. J. Chanover, C. B. Olkin, L. A. Young, H. B. Hammel, C. Miller, J. M. Bauer. An investigation of the temperature variations in Neptune's upper stratosphere including a July 2008 stellar occultation event. *Icarus*, Vol. 232, pp 22–33, April 2014.
- 2014 [K. Uckert](#), N. J. Chanover, S. Getty, W. B. Brinckerhoff, X. Li, M. Floyd, D. G. Voelz, X. Xifeng, R. Tawalbeh, N. McMillan, A. Chavez, P. J. Boston, D. A. Glenar, S. Ecelberger, and T. Cornish. A comparative study of *in situ* biosignature detection spectroscopy techniques on planetary surfaces. *Aerospace Conference, 2014 IEEE*, pp 1–12, March 2014.
- 2014 F. Alibay, P. Fernandes, R. McGranaghan, J. Leonard, R. Clegg, P. Craig, M. Day, N. Fougere, Z. Girazian, S. Hosseini, M. Hutchins, J. Scully, [K. Uckert](#), M. Malaska, A. Patthoff, P. Ries, C. Budney, K. Mitchell. Design of a low cost mission to the Neptunian system. *Aerospace Conference, 2014 IEEE*, pp 1–19, March 2014.
- 2013 [K. Uckert](#), N. Chanover, D. Voelz, D. Glenar, W. Brinckerhoff, S. Getty, N. McMillan, P. Boston, X. Xiao, R. Tawalbeh, X. Li. Spectral mixture and chemometric algorithms applied to the identification of biosignatures on planetary surfaces. *IEEE 5th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, pp 1–4, June 2013.
- 2013 N. Chanover, D. Voelz, D. Glenar, X. Xiao, R. Tawalbeh, [K. Uckert](#), P. Boston, S. Getty, W. Brinckerhoff, P. Mahaffy, X. Li. Results from an integrated AOTF-LDTOF spectrometer suite for planetary surfaces. *Aerospace Conference, 2013 IEEE*, pp 1–14, March 2013.
- 2012 N. Chanover, R. Tawalbeh, D. Glenar, D. Voelz, X. Xiao, [K. Uckert](#), P. Boston, S. Getty, W. Brinckerhoff, P. Mahaffy, T. Cornish, and S. Ecelberger. Rapid assessment of high value samples: An AOTF-LDTOF spectrometer suite for planetary surfaces. *Aerospace Conference, 2012 IEEE*, pp 1–10, March 2012.
- 2009 C. M. Raiteri and 68 coauthors, including [K. Uckert](#). WEBT multiwavelength monitoring and XMM-Newton observations of BL Lacertae in 2007–2008-Unveiling different emission components. *Astronomy & Astrophysics*, Vol. 507(2), pp 769–779, January 2009.
- 2008 C. M. Raiteri and 74 coauthors, including [K. Uckert](#). A new activity phase of the blazar 3C 454.3-Multifrequency observations by the WEBT and XMM-Newton in 2007–2008. *Astronomy & Astrophysics*, Vol. 491(3), pp 755–766, December 2008.
- 2008 C. M. Raiteri and 60 coauthors, including [K. Uckert](#). The high activity of 3C 454.3 in autumn 2007-Monitoring by the WEBT during the AGILE detection. *Astronomy & Astrophysics*, Vol. 485(2), pp L17–L20, July 2008.
- 2008 M. Villata and 51 coauthors, including [K. Uckert](#). Multifrequency monitoring of the blazar 0716+714 during the GASP-WEBT-AGILE campaign of 2007. *Astronomy & Astrophysics*, Vol. 481(2), pp L79–L82, April 2008.

## Conference Proceedings and Technical Reports

- 2016 [K. Uckert](#), S. Getty, A. Grubisic, X. Li, A. W. Yu, M. E. Fahey, W. B. Brinckerhoff, S. X. Li, T. Cornish, B. Farcy, J. E. Elsila. Organic Detection in Ocean World Analogs with a Two-Step Laser Desorption/Ionization Time-of-Flight Mass Spectrometer. *International Workshop on Instrumentation for Planetary Missions*, Abstract #4098, Pasadena, CA, October, 2016.
- 2016 X. Li, S. Getty, A. Grubisic, [K. Uckert](#), W. Brinckerhoff, T. Cornish, S. Ecelberger. Development of compact laser desorption/ionization time-of-flight mass spectrometer for planetary missions. *64th American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics*, San Antonio, TX, June 2016.
- 2016 S. A. Getty, A. Grubisic, [K. Uckert](#), X. Li, T. Cornish, J. E. Elsila, W. B. Brinckerhoff. Two-Step Resonance-Enhanced Desorption Laser Mass Spectrometry for In Situ Analysis of Organic-Rich Environments. *Lunar and Planetary Science Conference*, Vol. 47, Abstract #2693, The Woodlands, TX, March, 2016.
- 2016 [K. Uckert](#), N. J. Chanover, D. G. Voelz, X. Xiao, R. Hull, P. J. Boston, A. Parness, N. Abcouwer, A. Willig, C. Fuller. Near-IR Reflectance Spectroscopy in a Lava Tube Cave from a Robotic Platform. *Lunar and Planetary Science Conference*, Vol. 47, Abstract #2671, The Woodlands, TX, March, 2016.
- 2015 S. Getty, [K. Uckert](#), A. Grubisic, X. Li, T. Cornish, W. Brinckerhoff. Compositional Analysis of Primitive and Icy Planetary Surfaces with In Situ Two-Step Laser Mass Spectrometry. *American Geophysical Union Fall Meeting*, Abstract #P52A-03, San Fransisco, CA, December, 2015.
- 2015 [K. Uckert](#), N. J. Chanover, S. Getty, D. G. Voelz, W. B. Brinckerhoff, N. McMillan, X. Xiao, P. J. Boston, X. Li, A. McAdam, D. A. Glenar. The Characterization of Biosignatures in Caves using a Suite of Instruments. *2nd International Planetary Caves Conference*, Abstract #9023, Flagstaff, AZ, October 2015.
- 2015 N. J. Chanover, [K. Uckert](#), D. G. Voelz, X. Xiao, R. Hull, P. J. Boston, A. Parness, N. Abcouwer, A. Willig. Near-IR Reflectance Spectra in a Lava Tube Cave from a Robotic Platform. *2nd International Planetary Caves Conference*, Abstract #9032, Flagstaff, AZ, October 2015.
- 2015 [K. Uckert](#), S. A. Getty, N. Chanover, X. Li, W. B. Brinckerhoff, T. Cornish, D. Voelz, X. Xiao. IR Spectroscopy and Two-Step Laser Desorption/Ionization Time-of-Flight Mass Spectrometry as a Biosignature Identification Instrument Suite. *Astrobiology Science Conference*, Abstract #7607, Chicago, IL, June 2015.
- 2015 N. J. Chanover, [K. Uckert](#), D. Voelz, X. Xiao, P. J. Boston. Near-IR Reflectance Spectroscopy of Biovermiculation Patterns in a Sulfuric Cave Environment. *Astrobiology Science Conference*, Abstract #7597, Chicago, IL, June 2015.
- 2015 X. Li, [K. Uckert](#), S. Getty, A. Grubisic, W. Brinckerhoff, T. Cornish, S. Ecelberger, N. Chanover. Analysis of Aqueous Environments by Laser Desorption/Ionization Time-of-Flight Mass Spectrometry. *63rd American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics*, St. Louis, MO, May 2015.
- 2015 [K. Uckert](#), S. Getty, A. Grubisic, X. Li, W. Brinckerhoff, T. Cornish, N. Chanover, J. E. Elsila, R. Zare. A Demonstration of the Organic Detection Capabilities of a Two Step Laser Desorption/Ionization Time-of-Flight Mass Spectrometer. *63rd American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics*, St. Louis, MO, May 2015.
- 2015 S. A. Getty, X. Li, A. Grubisic, [K. Uckert](#), T. Cornish, J. E. Elsila, M. P. Callahan, W. B. Brinckerhoff. Two-Step Resonance-Enhanced Desorption Laser Mass Spectrometry for In Situ Analysis of Organic-Rich Environments. *Lunar and Planetary Science Conference*, Vol. 46, Abstract #2231, The Woodlands, TX, March, 2015.

- 2015 K. Uckert, N. J. Chanover, D. Voelz, X. Xiao, P. Boston. A Portable AOTF IR Reflectance Point Spectrometer for In Situ Biosignature Detection. *Lunar and Planetary Science Conference*, Vol. 46, Abstract #2694, The Woodlands, TX, March, 2015.
- 2015 S. A. Getty, W. B. Brinckerhoff, X. Li, A. Grubisic, K. Uckert, T. Cornish, A. E. Southard, M. Balvin, J. Ferrance, J. E. Elsila, M. P. Callahan, P. R. Mahaffy. Time-of-Flight Mass Spectrometry for In Situ Analysis of Biosignatures at Europa. *Workshop on the Potential for Finding Life in a Europa Plume*, Pasadena, CA, February, 2015.
- 2014 N. J. McMillan, A. Chavez, N. Chanover, D. Voelz, K. Uckert, R. Tawalbeh, J. Gariano, I. Dragulin, X. Xiao, R. Hull. Rapid and Portable Methods for Identification of Bacterially Influenced Calcite: Application of Laser-Induced Breakdown Spectroscopy and AOTF Reflectance Spectroscopy, Fort Stanton Cave, New Mexico. *American Geophysical Union Fall Meeting*, Abstract #B33B-0171, San Francisco, CA, December, 2014.
- 2014 N. J. Chanover, K. Uckert, D. Voelz, P. Boston. The Development and Field Testing of the Portable Acousto-optic Spectrometer for Astrobiology. *The 46th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society*, Vol. 46, Abstract #214.22, Tucson, AZ, November, 2014.
- 2014 K. Uckert, N. J. Chanover, S. Getty, A. Grubisic, X. Li, W. B. Brinckerhoff, T. Cornish, D. Voelz, X. Xiao, D. Glenar. Using IR Spectroscopy to Optimize Organic Detection with a Two-Step Laser Desorption/Ionization Time-of-Flight Mass Spectrometer. *International Workshop on Instrumentation for Planetary Missions*, Abstract #1113, Greenbelt, MD, November, 2014.
- 2014 N. J. Chanover, K. Uckert, D. Voelz, P. Boston. The Development and Field Testing of the Portable Acousto-optic Spectrometer for Astrobiology. *International Workshop on Instrumentation for Planetary Missions*, Abstract #1139, Greenbelt, MD, November, 2014.
- 2014 S. A. Getty, X. Li, T. Cornish, A. Grubisic, K. Uckert, J. Elsila, W. B. Brinckerhoff, Q. Wu, R. N. Zare. A Two-Step Tandem Laser Time-of-Flight Mass Spectrometer for the In Situ Study of the Surfaces of Primitive and Icy Solar System Bodies. *International Workshop on Instrumentation for Planetary Missions*, Abstract #1101, Greenbelt, MD, November, 2014.
- 2014 K. Uckert, N. J. Chanover, S. Getty, W. B. Brinckerhoff, D. G. Volez, N. McMillan, X. Xiao, X. Li, M. Floyd, P. J. Boston. The Identification of Biosignatures on Planetary Surfaces from in situ Techniques, Including Miniaturized Mass Spectroscopy. *62nd American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics*, Baltimore, MD, June 2014.
- 2014 M. Maldonado, S. Rees, A. Medina, D. Beasley, A. Campos, N. J. Chanover, K. Uckert, J. McKeever. Revealing the Universe to Our Community: NMSU's Society of Astronomy Students' Dedication to Public Outreach. *American Astronomical Society Meeting #223*, Abstract #160.11, Washington, DC, January, 2014.
- 2013 M. D. Day, M. J. Malaska, S. Hosseini, R. M. McGranaghan, P. A. Fernandes, R. N. Clegg, J. Scully, F. Alibay, P. Ries, P. L. Craig, M. L. Hutchins, J. Leonard, K. Uckert, A. Patthoff, Z. Girazian. Neptune and Triton: A Study in Future Exploration. *American Geophysical Union Fall Meeting*, Abstract #B33B-0171, San Francisco, CA, December, 2014.
- 2013 A. Chavez, K. Uckert, N. J. McMillan, N. Chanover, D. G. Voelz. Using Laser Induced Breakdown Spectroscopy (LIBS), Scanning Electron Microscopy (SEM), and Acousto-Optic Tunable Filter Spectroscopy (AOTF) to Distinguish Between Bacterially and Non-bacterially Influenced Calcite And Gypsum, Fort Stanton Cave, NM. *Geological Society of America Annual Meeting*, Vol 45(7), pp 777, Denver, CO, October 2013.

- 2013 S. Hosseini, P. Ries, P. Fernandes, M. Malaska, J. Scully, R. Clegg, A. Patthoff, F. Alibay, J. Leonard, K. Uckert, M. Day, M. Hutchins, N. Fougere, P. Craig, R. McGranaghan, Z. Girazian, K. Mitchell, C. Budney. TRIDENT: Taking Remote and In-situ Data to Explore Neptune and Triton. *The 45th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society*, Vol. 45, Abstract #211.29, Denver, CO, October, 2013.
- 2012 N. J. Chanover, K. Uckert, D. Glenar, D. Voelz, X. Xiao, R. Tawalbeh, P. Boston, S. Getty, W. Brinckerhoff, P. Mahaffy. A miniature spectrometer for the detection of organics and identification of their mineral context. *The 44th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society*, Vol. 44, Abstract #215.21, Reno, NV, October, 2012.
- 2012 K. Uckert, N. Chanover, C. Miller, C. Olkin, L. Young, H. Hammel, J. Bauer. An Investigation of the Seasonal Changes of Neptune's Atmosphere via a July 2008 Stellar Occultation Event. *The 44th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society*, Vol. 44, Abstract #412.24, Reno, NV, October, 2012.
- 2012 S. A. Getty, W. B. Brinckerhoff, T. Cornish, S. A. Ecelberger, X. Li, M. A. Merrill Floyd, N. Chanover, K. Uckert, D. Voelz, X. Xiao, R. Tawalbeh, D. Glenar, J. E. Elsila, M. Callahan. Laser Time-of-Flight Mass Spectrometry for Future In Situ Planetary Missions. *International Workshop on Instrumentation for Planetary Missions*, Vol. 1683, Abstract #1100, Greenbelt, MD, October, 2012.
- 2012 N. J. Chanover, D. A. Glenar, K. Uckert, D. G. Voelz, X. Xiao, R. Tawalbeh, P. Boston, W. Brinckerhoff, S. Getty, P. Mahaffy. Miniature Spectrometer for Detection of Organics and Identification of their Mineral Context. *International Workshop on Instrumentation for Planetary Missions*, Vol. 1683, Abstract #1142, Greenbelt, MD, October, 2012.
- 2012 K. Uckert, N. J. Chanover, D. A. Glenar, D. G. Voelz, X. Xiao, R. Tawalbeh, P. Boston, W. Brinckerhoff, S. Getty, P. Mahaffy. A miniature AOTF-LDTOF spectrometer suite for the detection of biomarkers on planetary surfaces. *Astrobiology Science Conference*, Abstract #4442, Atlanta, GA, April 2012.
- 2012 K. Uckert, N. J. Chanover, D. A. Glenar, D. G. Voelz, X. Xiao, R. Tawalbeh, P. Boston, W. Brinckerhoff, S. Getty, P. Mahaffy. A miniature AOTF-LDTOF spectrometer suite for the detection of biomarkers on planetary surfaces. *Life Detection in Extraterrestrial Samples*, Abstract #6042, San Diego, CA, February 2012.
- 2011 D. C. Hines, K. Uckert, N. Chanover, H. B. Hammel. Ice Giants: Uranus & Neptune. *James Webb Space Telescope: Science Operations Design Reference Mission: Solar System, Revision: C.*, ID: 92050, pp. B-12–B-14, December 2011.
- 2011 N. J. Chanover, D. A. Glenar, D. G. Voelz, X. Xiao, R. Tawalbeh, K. Uckert, P. Boston, W. Brinckerhoff, S. Getty, P. Mahaffy. Rapid Assessment of High Value Samples: A Miniature AOTF-LDTOF Spectrometer Suite for Cave Environments. *First International Planetary Cave Research Workshop*, Abstract #8019, Carlsbad, NM, October 2011.
- 2011 K. Uckert, N. Chanover, H. B. Hammel, D. C. Hines. Using the James Webb Space Telescope to Study Ice Giant Atmospheres. *EPSC-DPS Joint Meeting 2011*, Abstract #1542, Nantes, France, October 2011.
- 2010 K. Uckert. High Temperature Resistivity and Hall Effect Measurements of Conductive and Semiconductive Thin Films. *Ohio University Honors Tutorial College: Undergraduate Thesis*, Athens, OH, June 2010.

## Meeting Attendance

- 2016 **The 32nd Annual New Mexico Symposium**, Socorro, NM, November 4, 2016.  
*poster presentation*
- 2016 **International Workshop on Instrumentation for Planetary Missions (IPM-2016)**, Pasadena, CA, October 24–27, 2016.  
*poster presentation*
- 2016 **Biosignatures of Extant Life on Ocean Worlds (BELOW) Workshop**, Greenbelt, MD, September 12–14, 2016.
- 2016 **47th Lunar and Planetary Science Conference**, The Woodlands, TX, March 21–25, 2016.  
*poster presentation*
- 2015 **American Geophysical Union Fall Meeting**, San Francisco, CA, December 14–18, 2015.  
*oral presentation*
- 2015 **Second International Planetary Caves Conference**, Flagstaff, AZ, October 20–23, 2015.  
*oral presentation*
- 2015 **NMSU University Research Council Fair**, Las Cruces, NM, October 2, 2015.  
*poster presentation*
- 2015 **Astrobiology Science Conference (AbSciCon)**, Chicago, IL, June 15–19, 2015.  
*poster presentation*
- 2015 **63rd American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics**, St. Louis, MO, May 31 – June 4, 2015.  
*oral presentation*
- 2015 **Planetary Surface Processes Field School**, Centre for Planetary Science and Exploration: Western University, London, Ontario, Canada, May 12–22, 2015.  
*I participated in a field school located in northern Arizona and southern Utah, where I was introduced to processes that shape the surface of the Earth and other terrestrial planets, specifically volcanism, impact cratering, tectonics, and fluvial and aeolian erosion.*
- 2015 **New Mexico Institute of Mining & Technology Interdisciplinary Research Seminar on Astrobiology**, Socorro, NM, April 23, 2015.  
*oral presentation*
- 2015 **46th Lunar and Planetary Science Conference**, The Woodlands, TX, March 16–20, 2015.  
*poster presentation*
- 2015 **IEEE Aerospace Conference**, Big Sky, MT, March 7–14, 2015.  
*oral presentation*
- 2014 **NSS Southwestern Region Winter Technical Conference**, Las Cruces, NM, December 6, 2014.  
*oral presentation*
- 2014 **International Workshop on Instrumentation for Planetary Missions (IPM-2014)**, Greenbelt, MD, November 4–7, 2014.  
*oral presentation*
- 2014 **62nd American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics**, Baltimore, MD, June 15–19, 2014.  
*poster presentation*
- 2014 **ASMS Short Course: MS/MS: An Introduction**, Baltimore, MD, June 13–14, 2014.  
*A short course providing an overview of several mass spectrometry techniques and analyzers, a discussion of MS/MS rate theory, and a comparison of energy deposition mechanisms and dissociation times associated with popular instruments.*



- 2014 **NMSU Graduate Research and Arts Symposium**, *Las Cruces, NM*, March 10–12, 2014.  
*oral presentation*
- 2014 **IEEE Aerospace Conference**, *Big Sky, MT*, March 1–8, 2014.  
*oral presentation*
- 2014 **Workshop on the Habitability of Icy Worlds**, *Pasadena, CA*, February 5–7, 2014.
- 2014 **Outer Planets Assessment Group**, *Tucson, AZ*, January 13–14, 2014.  
*oral presentation*
- 2013 **JPL Planetary Science Summer School**, *Pasadena, CA*, August 12–16, 2013.  
*During this intensive week, our group, consisting of 16 scientists and engineers, designed a flyby spacecraft mission to Neptune. My primary leadership roles were: atmospheric science lead and mechanical structures & configuration chair.*
- 2013 **IEEE 5th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, *Gainesville, FL*, June 25–28, 2013.  
*oral presentation*
- 2013 **Astrobiology Graduate Student Conference (AbGradCon)**, *Montreal, Quebec, Canada*, June 10–14, 2013.  
*oral presentation*
- 2013 **New Mexico Research Exposition**, *Albuquerque, NM*, April 16, 2013.  
*poster presentation*
- 2013 **NMSU Graduate Research and Arts Symposium**, *Las Cruces, NM*, March 11–13, 2013.  
*oral presentation*
- 2012 **The 28th Annual New Mexico Symposium**, *Socorro, NM*, November 30, 2012.  
*oral presentation*
- 2012 **44th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society**, *Reno, NV*, October 14–19, 2012.  
*poster presentation*
- 2012 **Portable DEO-Nano Board FPGA Sensor System Workshop**, *Las Cruces, NM*, June 7–8, 2012.
- 2012 **Astrobiology Science Conference (AbSciCon) 2012: Exploring Life: Past and Present, Near and Far**, *Atlanta, GA*, April 16–20, 2012.  
*poster presentation*
- 2012 **Conference on Life Detection in Extraterrestrial Samples**, *San Diego, CA*, February 13–15, 2012.  
*poster presentation*
- 2011 **First International Planetary Caves Workshop: Implications for Astrobiology, Climate, Detection, and Exploration**, *Carlsbad, NM*, October 25–28, 2011.
- 2011 **The EPSC-DPS Joint Meeting 2011**, *Nantes, France*, October 2–7, 2011.  
*poster presentation*
- 2011 **Frontier Science Opportunities with the James Webb Space Telescope**, *Space Telescope Science Institute: Baltimore, MD*, June 6–11, 2011.

## Field Campaigns

- 2016 **Mn Oxide Study**, Fort Stanton Cave: Ruidoso, NM, September 10, 2016.  
*I led an investigation to Fort Stanton Cave to study manganese oxide residues. The project had two goals: 1) characterize biosignatures associated with microbial activity in Mn oxides using IR spectroscopy, mass spectrometry, and XRD; and 2) attempt to identify the source of the Mn oxides. We also monitored the level of flooding and atmospheric conditions of the cave to better understand its relationship with surface water flows.*
- 2015 **PASA - LEMUR Integration & Field Demonstration**, Four Windows Cave & Big Skylight Cave: El Malpais National Monument, NM, September 10–22, 2015.  
*We integrated the Portable AOTF Spectrometer for Astrobiology (PASA), a reflectance IR spectrometer, with LEMUR, a cave climbing robot. We measured basalt samples with PASA following a vertical traverse by LEMUR. We also collected astrobiologically interesting IR reflectance measurements with PASA in situ.*
- 2015 **PASA Field Demonstration**, Four Windows Cave: El Malpais National Monument, NM, May 8, 2015.  
*We demonstrated the operation of the Portable AOTF Spectrometer for Astrobiology (PASA) in Four Windows Cave, and collected astrobiologically interesting IR reflectance measurements in situ.*
- 2014 **PASA Field Demonstration**, Fort Stanton Cave: Ruidoso, NM, May 3, 2014.  
*We demonstrated the operation of the Portable AOTF Spectrometer for Astrobiology (PASA) in Fort Stanton Cave, and collected IR reflectance measurements of biologically mediated carbonates. Simultaneous measurements were collected with a portable laser-induced breakdown spectrometer (LIBS).*
- 2014 **Photo Documentation**, Fort Stanton Cave: Ruidoso, NM, April 21 – May 2, 2014.  
*I assisted with an extensive photo documentation of Fort Stanton Cave to contribute to the Fort Stanton Museum.*
- 2013 **PASA Field Demonstration**, Cueva de Villa Luz: Tabasco, Mexico, December 16–21, 2013.  
*We demonstrated the operation of the Portable AOTF Spectrometer for Astrobiology (PASA) in Cueva de Villa Luz. Cueva de Villa Luz is actively forming through sulfuric acid dissolution, and represents an extreme environment to test the capabilities of PASA.*
- 2013 **PASA Field Demonstration**, Fort Stanton Cave: Ruidoso, NM, October 30–31, 2013.  
*We demonstrated the operation of the Portable AOTF Spectrometer for Astrobiology (PASA) in Fort Stanton Cave, and collected IR reflectance measurements of biologically mediated carbonates and sulfates.*
- 2013 **Sample Collection for Biosignature Identification**, Four Windows Cave: El Malpais National Monument, NM, July 16, 2013.  
*We collected biologically active samples within the lava tube for measurement with a suite of instrument techniques to identify the presence of biosignatures.*
- 2013 **Sample Collection for Biosignature Identification**, Fort Stanton Cave: Ruidoso, NM, May 1–2, 2013.  
*We collected samples representing biologically- and abiotically-precipitated carbonates, metal oxides, and sulfates to measure with a suite of instrument techniques to identify the presence of biosignatures.*

## Technical Skills

Programming	Python	proficient
Languages	IDL	proficient
	Matlab	proficient
	ΛT <sub>E</sub> X	proficient
	HTML	proficient
	CSS	proficient
	C/C++	experienced
	Fortran	experienced
	LabVIEW	familiar with

	<b>JavaScript</b>	<i>familiar with</i>
Operating Systems	<b>Mac OSX</b>	<i>proficient</i>
	<b>Microsoft Windows</b>	<i>proficient</i>
	<b>Unix</b>	<i>proficient</i>
	<b>Linux</b>	<i>experienced</i>
Tools & Technologies	<b>Git</b>	<i>proficient</i>
	<b>Microsoft Office</b>	<i>proficient</i>
	<b>Tkinter</b>	<i>proficient</i>
	<b>Zemax Optical Design Software</b>	<i>proficient</i>
	<b>OpenOffice</b>	<i>experienced</i>
	<b>Android SDK</b>	<i>experienced</i>
	<b>Eclipse IDE</b>	<i>experienced</i>
	<b>Navigation &amp; Ancillary Information Facility (NAIF) SPICE</b>	<i>familiar with</i>
Observing	<b>NMSU Tombaugh Observatory 12" Meade &amp; 11" Celestron</b>	<i>proficient</i>
	<b>Apache Point Observatory Astrophysical Research Consortium 3.5-m</b>	<i>experienced</i>
	<b>MDM McGraw-Hill 1.3-m</b>	<i>familiar with</i>
	<b>Tortugas Mountain Observatory 24"</b>	<i>familiar with</i>

## Public Outreach

- 2016 **Sierra Middle School Campus Visit**, *NMSU Tombaugh Observatory: Las Cruces, NM*, November 11, 2016.  
I taught several groups of ~20 middle school students about the scale of the Solar System, telescope design, and the NMSU meteorite collection.
- 2016 **Hillrise Elementary Career Day**, *Hillrise Elementary School: Las Cruces, NM*, October 21, 2016.  
I taught elementary school students about meteorites, the formation of the solar system, and showed them how to safely view the sun through a solar telescope.
- 2016 **University Hills Career Day**, *University Hills Elementary School: Las Cruces, NM*, May 6, 2016.  
I taught elementary school students about meteorites, impact craters, and showed them how to safely view the sun through a solar telescope.
- 2016 **Astronomical Society of Las Cruces Speaker**, *Dona Ana Community College: Las Cruces, NM*, November 10, 2015.  
I gave a presentation to ~30 members of the Astronomical Society of Las Cruces focusing on the search for life in the universe.
- 2010 – 2015 **Campus Observatory Open House**, *NMSU: Las Cruces, NM*.  
At least once each academic year, I participated in an event at Tombaugh Observatory on NMSU's campus to operate telescopes and show astronomical objects to the public.
- 2015 **Star Party**, *Bassett Middle School: El Paso, TX*, November 10, 2015.  
I set up telescopes for ~100 middle school children to observe the Andromeda Galaxy, the Persei Cluster, and Albireo.
- 2015 **Lunar Viewing Night**, *Thomas Branigan Memorial Library: Las Cruces, NM*, September 19, 2015.  
I set up telescopes and gave a short presentation for ~75 elementary school children to observe the moon.
- 2015 **University Hills Career Day**, *University Hills Elementary School: Las Cruces, NM*, April 6, 2015.  
I taught elementary school students about solar flares and meteorites, and showed them how to safely view the sun through a solar telescope.

- 2015 **Sierra Middle School Science Olympiad**, *Sierra Middle School: Las Cruces, NM*, January 28, 2015.  
I taught the Sierra Middle School Science Olympiad team about water in the Solar System in preparation for their state competition.
- 2014 **Partial Solar Eclipse**, *Las Cruces, NM*, October 23, 2014.  
I helped organize and participated in a city-wide event to safely observe the partial solar eclipse in 2014.
- 2014 **Scientific Writing Seminar**, *Deming High School: Deming, NM*, February 11, 2014.  
I spoke with several English classes about the scientific peer review process and the scientific method.
- 2014 **Math and Science Night**, *North Valley Elementary School: San Miguel, NM*, January 30, 2014.  
I organized an observing event for ~200 elementary school students and gave a brief presentation about the exploration of the Solar System. Observations focused on Jupiter and the Galilean Moons.
- 2011 – 2013 **Sierra Middle School Campus Visit**, *NMSU Tombaugh Observatory: Las Cruces, NM*.  
Once each year, I led activities for several groups of ~20 middle school students including a scale model of the Solar System, telescope design, and solar telescope viewing.
- 2013 **Farmers Market Solar Telescope Viewing**, *Las Cruces, NM*, November 2, 2013.  
I helped NMSU undergraduates organize an outreach event at the Las Cruces farmers market, focusing on short lectures of solar activity and solar telescope viewing.
- 2013 **Star Party**, *Loma Linda Elementary School: Anthony, NM*, September 5, 2013.  
I organized an observing event for ~200 elementary school students and gave a brief presentation about exploration of the Solar System. Observations focused on Venus.
- 2013 **White Sands Science Fair**, *White Sands Schools: White Sands Missile Range, NM*, January 29, 2013.  
I helped judge ~20 middle school student science fair projects and provided them with feedback.
- 2011 – 2012 **Southern New Mexico Science, Engineering, Mathematics, and Aerospace Academy**, *Mesquite Elementary School: Mesquite, NM*, November 4, 2011 & November 28, 2012.  
I gave presentations describing the exploration of the Solar System, solar activity, and galactic structure to several groups of ~20 middle school students.
- 2012 **Venus Transit Event**, *Las Cruces, NM*, June 5, 2012.  
I helped organize and participated in a city-wide event to safely observe the Venus transit in 2012.
- 2012 **Total Solar Eclipse**, *Las Cruces, NM*, May 20, 2012.  
I helped organize and participated in a city-wide event to safely observe the total solar eclipse in 2012.
- 2012 **Sunrise Lion's Club**, *Sunrise Lion's Club: Las Cruces, NM*, March 8, 2012.  
I gave a presentation to ~50 members of the Sunrise Lion's Club focusing on the Hubble Deep Field and recent solar activity, and fielded many questions regarding the place for religion in science.
- 2011 **Sky Safari**, *NMSU Tombaugh Observatory: Las Cruces, NM*, July 9, 2011.  
I participated in an event at Tombaugh Observatory on NMSU's campus to operate telescopes and show astronomical objects to the public.
- 2009 – 2010 **Ohio High School Science Fair**, *The Ohio Academy of Science: Columbus, OH*.  
I helped judge ~50 high school student science fair projects and provided them with feedback.

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## Service

- 2016 – 2016 **Vice Chairman**, *Mesilla Valley Grotto*, February 2016 – Present.  
I participate in, and help organize local caving activities for recreation, restoration, training, and outreach purposes.
- 2014 – 2016 **NASA Review Panel: Executive Secretary**, *Planetary Science Division of NASA's Science Mission Directorate*, 2014, 2015, 2016.  
I served as an executive secretary on three NASA review panels, participated as an external reviewer, and organized notes emerging from discussions.

- 2012 – 2015 **Webmaster**, *NMSU Graduate Student Council*, Fall 2012 – Spring 2015.  
I maintained the NMSU Graduate Student Council webpages and participated in all council meetings as an executive member.
- 2013 – 2015 **Graduate Research and Arts Symposium: Organizer**, *NMSU Graduate Student Council*, March 2013, March 2014, March 2015.  
I created the schedule, program, and website for the NMSU Graduate Research and Arts Symposium.
- 2014 – 2015 **Campus Planning Committee: Graduate Student Representative**, *NMSU*, Fall 2014 – Spring 2015.  
I served as the graduate student representative on the NMSU campus planning committee, advocating for long-term changes to the NMSU main campus, consistent with the needs of graduate students.
- 2014 – 2015 **Journal Club Organizer**, *NMSU Astronomy*, Fall 2013 – Spring 2014.  
I led the NMSU Astronomy department journal club.
- 2015 **NMSU Graduate Student Pay Gap Initiative: Founder**, *NMSU*, May 2015.  
I founded a graduate student advocacy group dedicated to increasing NMSU graduate student stipends to a level consistent with NMSU peer institutions.
- 2013 – 2014 **NMSU Society of Astronomy Students: Graduate Student Liaison**, *NMSU Astronomy*, Fall 2013 – Spring 2014.  
I served as a liaison between the undergraduate astronomy club and the NMSU Astronomy department, assisted with fundraising, and helped organize public outreach activities.

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## Professional Membership

- 2010 – American Astronomical Society/Division for Planetary Sciences
- 2013 – Institute of Electrical and Electronics Engineers
- 2014 – National Speleological Society
- 2014 – American Society of Mass Spectrometry
- 2015 – American Geophysical Union

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## Certifications

- April 2013 Leave No Trace Trainer Certification: Leave No Trace Center for Outdoor Ethics
- June 2012 Certificate of Completion: NMSU Portable DEO-Nano Board FPGA Sensor System Workshop
- June 2009 Physics Machine Shop Safety Training: Ohio University
- March 2007 Scuba Diver, NAUI Certification: Ohio University