

Alexander K. Kendrick

Department of Geophysics
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EDUCATION

Stanford University, Stanford, CA
PhD in Geophysics, expected June 2020

Harvey Mudd College, Claremont, CA
B.S in Physics with distinction, May 2015

COMPUTER SKILLS

Languages: C++, Java, Python, Bash, Racket, Prolog
Software: Matlab, COMSOL, IDL, Simulink, Mathematica

HONORS AND AWARDS

ARCS Foundation Scholar (2017)
Dean's List, Harvey Mudd College (Spring 2012, Fall 2012, Spring 2013, Spring 2014, Fall 2014, Spring 2015)
Distinguished Student Award, Los Alamos National Laboratory (2013)
Los Alamos National Laboratory Foundation Bronze Scholar (2011)
1st Place in Engineering: Electrical and Mechanical at the Intel International Science and Engineering Fair (ISEF) in Los Angeles, CA (2011) for improving an electromagnetic system to characterize an underground river system in New Mexico and for remotely tracking changes in subsurface flow
3rd Place in Engineering: Electrical and Mechanical at ISEF in San Jose, CA (2010) for developing an electromagnetic system to characterize an underground river system in New Mexico
Office of Naval Research Scholarship awarded at ISEF (2010)
Society of Exploration Geophysicists Distinguished Achievement Award awarded at ISEF (2010)
1st Place and Best in Category Grand Award in Engineering: Electrical and Mechanical at ISEF in Reno, NV (2009) for developing a low frequency radio for cave and mine rescues
Society of Exploration Geophysicists Distinguished Achievement Award, awarded at ISEF (2009)
International Council on Systems Engineering Award, awarded at ISEF (2009)
Grand Award from the Patent and Trademark Office Society (for projects across multiple ISEF categories), awarded at ISEF (2009)

RESEARCH AND WORK EXPERIENCE

Dissertation Research, Stanford University, Stanford, CA Fall 2015 - current
Research Advisor: Dr. Rosemary J Knight

- Laboratory study using nuclear magnetic resonance (NMR) to investigate flow in porous media for soil science and hydrologic applications
- NMR flow experiments will provide a new method to distinguish between mobile and less-mobile porosity domains in near-surface materials
- Will investigate how physical, chemical and biological processes alter fluid flow at the pore scale with a combination of μ CT and NMR experiments

Secondary Project Research, Stanford University, Stanford, CA Fall 2016 - current
Research Advisor: Dr. Dustin M. Schroeder

- Writing MATLAB code to investigate how different glacial properties could impact radar attenuation in order to explain time dependent variation present in experimental data collected on a marine terminating glacier in Greenland

Los Alamos National Laboratory, Los Alamos, NM Summer 2015

- Improved IDL scripts to identify total electron content (TEC) disturbances measured by NOAA's CORS network of GPS receivers near large thunderstorms over various regions in the continental United States
- Confirmed the existence of measureable TEC disturbances across multiple summers of CORS data

Physics-Engineering Clinic, Harvey Mudd College, Claremont, CA Fall 2014-Spring 2015

- HRL Laboratories sponsored project to design an optical network to deliver a series of laser pulses to a quantum dot for quantum communication applications (5-person team)
- Led development with one other student on creating optical network simulation tools in Simulink
- Co-wrote mid-year report and a work plan to present research and project status to company liaisons

Department of Physics, Harvey Mudd College, Claremont, CA Spring 2014-Spring 2015

- Modelled post-glacial rebound and fault mechanics using finite-element simulation tools
- Used computer tools to create geometric models for simulations

Grader and Tutor, Computer Science Department, Harvey Mudd College, Claremont, CA Fall 2013-Fall 2014

- Graded student assignments and assisted students with solving computational problems

Harvard-Smithsonian Center for Astrophysics Solar REU Summer 2014

- Used and wrote IDL scripts to measure and automatically determine the radial kinematics of off-limb coronal bright fronts driven by solar coronal mass ejections
- Characterized the lateral expansion of coronal bright fronts using image processing techniques
- Analyzed kinematics information of coronal bright fronts to constrain geometric models aimed at better understanding solar energetic particle (SEP) acceleration

Los Alamos National Laboratory, Los Alamos, NM Summers 2010-2013

- Used and modified IDL scripts to identify TEC disturbances measured by NOAA's CORS network of GPS receivers in the Great Plains region of the US associated with mesoscale thunderstorms (2013)
- Characterized space weather and coronal mass ejections impact on the ionosphere using total electron content data collected using a Kalman filter system (2012).
- Assisted with implementation of a Kalman filter based total electron content computer program for real time data analysis from GPS receivers (2012).
- Characterized lightning strikes associated with the deadly Joplin, MO tornado to identify storm intensity (2011).
- Developed graphical analysis tools for a network of low frequency antennas (2010).
- Presented results via symposia, conferences, and seminars

Grader, Chemistry Department, Harvey Mudd College, Claremont, CA Fall 2012

- Graded Freshman Lab reports with an emphasis on proper documentation of laboratory procedures.

Independent Research, Los Alamos, NM 2009-2011

- Developed and tested a frequency domain electromagnetic system for the characterization of an underground river in New Mexico (2010-2011).
- Designed and tested a low frequency digital radio for cave and mine rescues (2008-2010).
- Established two-way text based digital communication at a depth of 300m in Carlsbad Caverns, NM (2010)

ACTIVITES

- Graduate Student Advisory Council**, Stanford University, Stanford, CA 2016-2017
- Served as a liaison between geophysics graduate students and the Dean's Office of the School of Earth, Energy and Environmental Science; helped organize events for graduate students
- Honor Board Member**, Harvey Mudd College, Claremont, CA 2014-2015
- Served as either a hearing board member or an investigator to help settle disputes regarding academic or disciplinary violations of the honor code at Harvey Mudd College

PROFESSIONAL AFFILIATIONS

Student Member, American Geophysical Union

PUBLICATIONS

Lay, E. H., Shao, X. M., **Kendrick, A. K.**, & Carrano, C. S. (2015). Ionospheric acoustic and gravity waves associated with midlatitude thunderstorms. *Journal of Geophysical Research: Space Physics*, 120(7), 6010-6020.

Kendrick, A. "Electromagnetic Surveying for Underground Water Detection", *The CREG Journal* 75. (December 2010). 11-13. Published by the British Cave Research Association.

Kendrick, A. "Underground Imaging." *The Leading Edge* 29 (October 2010): 1298-1302. Published by the Society of Exploration Geophysicists

Kendrick, A. "2009 ISEF: The underground radio II." *The Leading Edge* 28 (October 2009): 1268-1269. Published by the Society of Exploration Geophysicists

POSTER PRESENTATIONS

Kendrick, A., K. Kozarev, "Automated Kinematics Analysis of Off-Limb Coronal Bright Fronts Observed with SDO/AIA", Living With a Star (LWS) Science Meeting in Portland, OR, Nov 2014.

Kendrick, A., E.H. Lay, T. Hamlin, "Investigation of TEC Perturbations near Thunderstorms at Los Alamos GPS Receivers", Coupling, Energetic and Dynamics of Atmospheric Regions Workshop (CEDAR) in Boulder, CO, July 2013.

Kendrick, A., T. Hamlin, "Total Electron Content Variation During Solar Storms" Los Alamos National Laboratory Student Symposium, Aug 2012

ORAL PRESENTATIONS

Lay, E.H., X-M Shao, **A. Kendrick**, and C.S. Carrano, A statistical study of mid-latitude thunderstorm characteristics associated with acoustic and gravity waves, Amer. Geophys. Union Fall Meeting, San Francisco, CA, Dec. 2014

Kendrick, A., K. Kozarev, "Automated Kinematics Analysis of Off-Limb Coronal Bright Fronts Observed with SDO/AIA", Harvard-Smithsonian Center for Astrophysics Solar Intern Symposium, Aug 2014.

Lay, E.H., X-M Shao, and **A. Kendrick**, A statistical study of thunderstorm characteristics associated with acoustic waves, Intl. Conf. on Atmospheric Electricity, Norman, OK, June 2014.

Kendrick, A., E.H. Lay, T. Hamlin, "Investigation of TEC Perturbations near Thunderstorms at Los Alamos GPS Receivers", Intelligence and Space Research group seminar, Aug 2013.

Kendrick, A., T. Hamlin, "Los Alamos Sferic Array Observations of Lightning during the Joplin EF-5 Tornado" Los Alamos National Laboratory Student Symposium, Aug 2011.

Kendrick, A., T. Hamlin, "Los Alamos Sferic Array Observations of Lightning during the Joplin EF-5 Tornado", Intelligence and Space Research group seminar, Aug 2011.

Kendrick, A. "The Underground Radio II", RF/Microwave design group at Sandia National Laboratory, Albuquerque, NM, 2010.

Kendrick, A. "The Underground Radio II", Los Alamos HAM Radio Club, Los Alamos, NM, 2010.

Kendrick, A. "The Underground Radio" to the Winter Technical Meeting of the Southwestern Region of the National Speleological Society, Albuquerque, NM, 2009.