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Albuquerque, New Mexico 87123

# Andréa Darrh

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## EDUCATION

**Colorado School of Mines**, Golden, Colorado  
Doctor of Philosophy in Geophysics, May 2023  
Minor in Computational and Applied Math

**Texas A&M University**, College Station, Texas  
Bachelor of Science in Geophysics, May 2018  
Minors in Geology and Mathematics  
Honors Fellows, *magna cum laude* (GPA: 3.875)

## EXPERIENCE

**Sandia National Labs**, Albuquerque, New Mexico May 2017-Present  
*Senior Member of the Technical Staff (2023-Present), Geophysics R&D Student Intern (2017-2023)*

- Forward model and inversion development for seismic and non-seismic data
- Development of mean free path inversion code to characterize shear wave generation
- Evaluation of Hankel transform implementations used in electrical and electromagnetic methods
- Coherence and beamforming analysis of seismic data collected over a large seismic array.

**Geophysics Department, Colorado School of Mines** August 2018-May 2023  
*Graduate Research Assistant, Advisor- Dr. Yaoguo Li*

- August 2018- August 2021: Characterization of anisotropic conductivity using the magnetotelluric method for use in geologic interpretation.
- August 2021-May 2023: Joint inversion of magnetotelluric and magnetic datasets as applied to critical mineral exploration in the midcontinental United States.
- May 2022-May 2023: Development of the dell-manifold criterion for selecting optimal regularization in a simultaneous joint inversion algorithm.

**Department of Geology and Geophysics, Texas A&M University** February 2014-May 2018  
*Undergraduate Research Assistant, Advisor- Dr. Mark Everett*

- August 2015- May 2018: Modeling the CSEM response of Upheaval Dome: Derived impedance recursion equation to design geologic models of current day structure.
- August 2015- May 2016: Investigation of the Odessa Meteorite Crater Structure Using High Resolution Geophysics: Collected gravity and GPR data and created a piece-wise and linear drift correction for gravity anomalies.
- August 2014- May 2015: Camptown Cemetery Project: Assisted in field collection of data used to determine where unmarked graves were located using magnetometer and electromagnetic methods.

## PRESENTATIONS AND PUBLICATIONS

**Darrh, A., Bodmer, M., & Poppeliers, C., 2024.** Spatially dependent seismic wavefield scattering from an underground chemical explosion: Analysis of the Source Physics Experiment Dry Alluvium Geology Large-N array. *Bulletin of the Seismological Society of America*, <https://doi.org/10.1785/0120230057>.

**Darrh, A., & Li, Y.** Joint inversion of magnetic and magnetotelluric data using fuzzy c-means clustering, *IMAGE Annual Meeting*, August 2023.

**Darrh, A., & Li, Y.** Are we there yet? Criteria for choosing optimal regularization in simultaneous joint inversion problems, *IMAGE Annual Meeting*, August 2023.

- Weiss, C., Hammack, R. W., Beskardes, G. D, **Darrh, A.**, Kohnke, C., Morency, C., Mukherjee, S., Wu Y., 2024 Well identification efforts under the CATALOG consortium: A multi-physics strategy developed through the United States National Laboratory System, *IMAGE Annual Meeting*, August 2023.
- Weiss, C. J., Beskardes, G. D., & **Darrh, A.**, 2022. HIP-FEM: A Hierarchical, Induced Polarization Finite Element Method for analysis of thin dispersive geoelectric features. *EM Induction Workshop*, September 2022.
- Darrh, A.**, & Li, Y., 2022. Understanding the effect of 1-D dipping anisotropic conductivity on the response and interpretation of magnetotelluric data. *Geophysical Journal International*, **230**(3), 1948-1965.
- Darrh, A.** and Li, Y., Characterization of 1D anisotropic conductivity using magnetotelluric data, *Society of Exploration Geophysicists Annual Meeting*, October 2020.
- Darrh, A.** and Weiss, C. J., A Comparison of Computational Issues in the Evaluation of Hankel Transforms for Geophysical Electromagnetics. *American Geophysical Union Fall Meeting*, December 2019.
- Darrh, A.**, Poppeliers, C., Preston, L., 2019. Azimuthally Dependent Seismic-Wave Coherence at the Source Physics Experiment Large-N Array. *Bulletin of the Seismological Society of America*, **109**(5), pp. 1935-1947.
- Darrh, A.**, Poppeliers, C., and Preston, L., Azimuthally dependent scattering of high frequency vertical component seismic data at the Large N array, Source Physics Experiment, *Seismological Society of America Annual Meeting*, April 2019.
- Darrh, A.**, Poppeliers, C., and Preston, L., Azimuthally dependent scattering of high frequency vertical component seismic data at the Large N array, Source Physics Experiment, *American Geophysical Union Fall Meeting*, December 2018.
- Darrh, A.** and Everett M.E., Modeling the long dipole CSEM response of a resistive layer, *Geology and Geophysics Symposium*, March 2018.
- Darrh, A.**, Downs, C., and Poppeliers, C., Imaging electrical conductivity, permeability, and/or permittivity contrasts using the Born Scattering Inversion (BSI), *American Geophysical Union Fall Meeting*, December 2017.

## **SERVICE AND ACTIVITIES**

- Society of Exploration Geophysicists (SEG)** 2014-Present  
*Member*
- Session chair for IMAGE 2022 and IMAGE 2023 sessions
  - Participated in global networking events with women in geophysics through Skype
  - Assisted in outreach through a podcast interview conducted by SEG (Summer 2016)
- CGEM Group Coordinator**, Colorado School of Mines 2018-2022  
*Group Coordinator*
- Coordinate and moderate Center for Gravity, Electrical, and Magnetic Studies (CGEM) group meetings
  - Organize and moderate annual consortium meeting with sponsors
  - Keep and maintain records on past meetings, presentations, and consortiums
- Graduate Advisory Committee**, Colorado School of Mines 2019-2020  
*Graduate Student Representative*
- Advise on graduate policies for the Department of Geophysics
  - Review and approve degree requirement paperwork submitted by geophysics graduate students
  - Review incoming graduate applications
- Society of Geophysics Graduate Students (SGGS)**, Colorado School of Mines 2018-2020  
*President (2019-2020), Social Chair (2018-2019)*

- (2019 - 2020) Serve as the student representative to the Department of Geophysics Graduate Advisory Committee (GAC)
- Develop activities and events for geophysics graduate students
- Encourage networking within the Geophysics Department

**Undergraduate Research Ambassador**, Texas A&M University 2016-2018

*Research Ambassador*

- Promote undergraduate research through presentations given to students
- Meet with administrators, faculty, and prospective students to promote undergraduate research

**Honors and Undergraduate Research Advisory Committee (HURAC)**, Texas A&M University

*Student representative (Selected September 2016)* 2016-2018

- Provide advice on University-wide Honors Programs and Undergraduate Research policies
- Vote on University policies regarding Honors and Undergraduate research

**Honors Housing Community Student Leaders**, Texas A&M University 2015-2017

*Junior Advisor (President 2016-2017), (Sophomore Advisor 2015-2016)*

- Advise, mentor, and assist a group of 29 sophomore advisors
- Oversee the development of activities to encourage freshmen personal and professional growth

**University Scholars**, Texas A&M University 2015-2018

*University Scholar*

- Act as an ambassador for the Honors program
- Engage in classes for professional and personal development

## HONORS AND AWARDS

Secretary of Energy Achievement Honor Award (as part of the SPE DAG team)	2021
Hess Leadership Scholarship	2020
Best Student Presentation- Sandia Center 8800 Student Symposium	2019
SEG/Equinor Scholarship	2019-2020
Shirley A. and Stanley H. Ward Scholarship	2018-2022
Geology and Geophysics Outstanding Senior Award	2018
College of Geosciences Outstanding Student Award	2018
College of Geosciences Silver Medallion Award	2018
Honors Fellows	2018
Phi Beta Kappa	2018
George W. Crocker Scholarship	2017-2018
George W. Crocker Merit Scholarship	2017-2018
Undergraduate Research Scholar	2016-2017
University Scholar	2015-2018
Rosie M. and Murry D. Page Scholarship	2015-2016
SEG/Anadarko Scholarship Award	2014-2018
James R. and Norine Jackson Scholarship	2014-2017