



## EDUCATION

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**University of Texas, Austin TX**

*PhD. Engineering*, est. Summer 2025 — *Current*

Advisor: Dr. Michael Cullinan

Nanoscale Design and Manufacturing Laboratory

Cumulative GPA: 3.89 on a 4.0 scale

**University of Texas, Austin TX**

*M.S. Engineering*, 2022

Advisor: Dr. Michael Cullinan

Nanoscale Design and Manufacturing Laboratory

**Austin College, Sherman TX**

*B.A. Physics*, 2019

Major: Physics

Minors: Math, Spanish

## EXPERIENCE

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**University of Texas at Austin**

*Graduate Researcher*, 2019 — *Current*

*Graduate Researcher in the Nanoscale Design and Manufacturing Laboratory*

Advisor: Dr. Michael Cullinan

- Data management for machine learning in accelerating nanoscale characterization methods
- Optimization of large-scale nanometrology (atomic force microscopy) and error correction techniques using high-performance computing.
- B-spline curve and NURBS surface modeling of 3D AFM data in python.

**Sandia National Laboratories**

*R&D Intern*, 2021 — *Current*

*Graduate Research Intern at the Center for Integrated Nanotechnologies*

Advisor: Dr. Rémi Dingreville

- Nanometrology data analysis and sparse image reconstruction with machine learning and high-performance computing systems.

**Machined Form Design**

*Summer Intern*, 2019

- 3D scanning (FARO 3D Scanner, Geomagic Wrap Scan Processor) and SolidWorks CAD modeling for custom automotive redesigns and builds.

**Austin College**

*Physics Senior Research Project*, 2018-19

Advisor: Dr. David Baker

- Photometric Observations from the Adams Observatory in Support of NASA's TESS Mission.

**University of Michigan Ann Arbor**

*NSF Sponsored REU*, Summer 2018

Advisor: Dr. Jennifer Ogilvie

- Studied the reaction center of the photosystem II complex in spinach using ultra-fast interferometry.

**Rensselaer Polytechnic Institute**

*NSF Sponsored REU*, Summer 2017

Advisor: Dr. Vidhya Chakrapani

- Studied changes in electric properties of transition metal oxides

## HONORS & AWARDS

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- National Science Foundation Graduate Research Fellow, 2021-2024
- Virginia & Ernest Cockrell, Jr. Fellowship in Engineering, 2019-2023
- T. W. Whaley, Jr. Friends of Alec Endowed Scholarship from the University of Texas Cockrell School of Engineering, 2019-2020
- Mary Foulks Gourley & Lloyd E. Gourley Prize for an Outstanding Student in Physics, 2018

## PUBLICATIONS

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- [1] Natinsky, E., Connolly, L.G., & Cullinan, M. (2024). Three-dimensional visualization of large-area, nanoscale topography measurements. *Nanotechnology*, 35. <https://doi.org/10.1088/1361-6528/ad8165>.
- [2] Natinsky, E., Khan, R. M., Cullinan, M., & Dingreville, R. (2024). Reconstruction of high-resolution atomic force microscopy measurements from fast-scan data using a Noise2Noise algorithm. *Measurement*, 227. <https://doi.org/10.1016/j.measurement.2024.114263>
- [3] Connolly, L., Natinsky, E., Khusnatdinov, N., Jones, C., Mizuno, M., Messl, M., . . . Cullinan, M. (2020). The role of visualization and error correction in very large area, tip-based topography measurement. *American Society for Precision Engineering*.
- [4] Huber, D., Chaplin, W. J., Chontos, A., Kjeldsen, H., Christensen-Dalsgaard, J., Bedding, T. R., . . . Howard, A. W. (2019). A Hot Saturn Orbiting an Oscillating Late Subgiant Discovered by TESS. *The Astronomical Journal*, 157(6), 245. <https://doi.org/10.3847/1538-3881/ab1488>

## POSTERS AND PRESENTATIONS

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- Presentation:* “Integrating multimodal metrology with machine learning for reliable characterization in advanced chip packaging.” Truman fellowship finalist proposal presentation, January 2025.
- Presentation:* “Accelerating microscopy for nanoscale fabrication via deep-learning image reconstruction.” UT Austin PhD research proposal, April 2024.
- Presentation:* “Deep learning image reconstruction for microscopy data.” Sandia National Laboratories *BeyondFingerprinting* Grand Challenge External Advisory Board Meeting, April 2024.
- Poster:* “Reconstruction of sparse, nano-scale metrology data for efficient process control.” Sandia Academic Alliance Spring UT Austin Research Poster Session, March 2022.
- Presentation:* “Signal reconstruction of sparse, nano-scale metrology data for time efficient process control.” IS&T Electronic Imaging Symposium, January 2022.
- Presentation:* “Signal reconstruction of sparse, nano-scale metrology data using Noise2Noise.” Sandia National Labs Academic Alliance Program, July 2021.
- Poster:* “The role of visualization and error correction in very large area, tip-based topography measurement.” American Society for Precision Engineering annual conference, October 2020.
- Poster:* “Detection of exoplanets at the Austin College Adams Observatory.” Austin College Scholarship Conference, March 2018.

*Poster:* “Studying transition metal oxides by tracking electrochemical reactions.” NSF sponsored REU at Rensselaer Polytechnic Institute, August 2017.

*Presentation:* “Using ultrafast laser-pulse spectroscopy for observations of photosynthesis in spinach.” NSF sponsored REU at the University of Michigan at Ann Arbor, August 2018.

*Presentation:* “Simulating the back reaction in gravitational waves with a spring-mass system.” Austin College Scholarship Conference, March 2018.

*Presentation:* “Observing exoplanets with the Austin College Adams Observatory for admission in to KELT.” Austin College Spring Research Presentations, April 2017.