

DUNCAN MIERTSCHIN

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3612 Van Tassel St
Amarillo, TX 79121

EDUCATION

BS West Texas A&M University, Physics August 2018- May 2022
Minor in Mathematics, Condensed Matter Physics Research, Honors
GPA: 3.6/4.0

High School Amarillo High School May 2018
National Honors Society

HONORS AND AWARDS

Dean's List FA 2018, SP 2020
Recognition for excellent performance in academics

President's List SP 2019, FA 2020, FA 2021
Recognition for excellent performance in academics

Welch Foundation Fellowship 2020, 2021, 2022
A research fellowship provided to students funding for research as well as a stipend.
Projects:

- "Magnetic Levitation using a YBCO Superconductor"
- "Magnetotransport studies of $\text{Sb}_2\text{Se}_2\text{Te}$ and $\text{Sb}_2\text{Te}_2\text{Se}$ "
- "Fermi surface studies of $\text{Sn}_x\text{Pb}_{1-x}\text{Te}$ "
- "Doping Dependence Studies of $\text{Sn}_x\text{Pb}_{1-x}\text{Te/Se}$ system"

Treasure Basher Endowed Scholarship in Physical Sciences 2020, 2021, 2022
Financial aid provided to a physics major who is involved in the community and is of good academic standing

Robert E. Barieau Research Scholarship 2020, 2021, 2022
Financial aid provided to a physics major of good academic standing and performs research.

Kilgore Research Center Undergraduate Student Research Grant 2020, 2021, 2022
Research grant provided by the KRC at WTAMU that provides funding for research as well as employment as a student researcher.

Projects:

- "Magnetoresistance Studies of $\text{Sb}_2\text{Se}_2\text{Te}$ and $\text{Sb}_2\text{Te}_2\text{Se}$ "
- "Torque magnetometry studies of topological tin-doped lead selenide/telluride single crystals"

Outstanding Presentation, Gulf Coast Undergraduate Research Symposium 2021
Recognition for one of the outstanding presentations at GCURS at Rice University, this was for the Applied Physics section 2021.

RESEARCH EXPERIENCE

West Texas A&M University, Canyon, TX 2020 to 2022
Student Research, Advisor: Dr. Keshav Shrestha

- (PI) Magnetic Levitation using a YBCO superconductor
- Published in Vol. 33, No. 33 of Journal of Condensed Matter Physics. Title: “Large Magnetoresistance and Quantum Oscillations in $\text{Sn}_{0.05}\text{Pb}_{0.95}\text{Te}$ ”
- (PI) Magnetotransport Studies of $\text{Sb}_2\text{Se}_2\text{Te}$ and $\text{Sb}_2\text{Te}_2\text{Se}$ topological insulators
- (PI) Doping dependence Fermi Surface studies of $\text{Sn}_x\text{Pb}_{1-x}\text{Te/Se}$ topological crystalline insulator
- Fermi Surface studies of Kagome superconductor CsV_3Sb_5 under high magnetic fields
- Fermi surface studies of ZrSiS topological insulator
- Performed experiments at the National High Magnetic Field Laboratory in Tallahassee, FL, November 2021
- Collaborated with Idaho National Laboratory for $\text{Sb}_2\text{Se}_2\text{Te}$ and $\text{Sb}_2\text{Te}_2\text{Se}$
- Collaborated with Los Alamos for $\text{Sn}_x\text{Pb}_{1-x}\text{Te/Se}$

TEACHING EXPERIENCE

West Texas A&M University, Canyon, TX August 2019 to July 2022
Teaching Assistant, Chemistry and Physics department

- Taught PHYS 1401, PHYS 1402, PHYS 2425, and PHYS 2426 labs as well as graded them
- Graded homework and tests for professors
- Tutored students at the Chemistry and Physics Help Lab

PUBLICATIONS

Journal Publications

Shrestha, K.; Miertschin, D.; Sankar, R.; Lorenz, B.; Chu, C. W. “Large Magnetoresistance and Quantum Oscillations in $\text{Sn}_{0.05}\text{Pb}_{0.95}\text{Te}$ ”. *Journal of Physics: Condensed Matter* **2021**, 33 (33), 335501.

Journal Papers Accepted

Shrestha, K; Miertschin, D; et al. “Non-trivial Fermi surface topology of Kagome superconductor CsV_3Sb_5 probed by de Haas-van Alphen oscillations” Accepted to: *Physical Review B*, December 2021.

PRESENTATIONS AND INVITED LECTURES

Faculty Research Presentation 2020, “Superconductors”. February 2020. Presented the usefulness and interest of my research at WTAMU.

Invited Class Presentations, “Superconductors and Topological Materials”, PHYS 1401, PHYS 1402, PHYS 2425, PHYS 2426. Fall 2020, Spring 2021, Fall 2021, Spring 2022. Presented the basics of research into superconductors and topological materials to physics classes to bring awareness and interest to physics research.

Faculty Research Presentation 2021, “Large magnetoresistance and quantum oscillations in $\text{Sn}_{0.05}\text{Pb}_{0.95}\text{Te}$ ”. March 2021. Online presentation of research of my research at WTAMU.

APS March Meeting 2021, “Large magnetoresistance and quantum oscillations in $\text{Sn}_{0.05}\text{Pb}_{0.95}\text{Te}$ ”. March 2021. Online presentation of research at the APS March Meeting.

WTAMU Undergraduate Student Research Conference 2021, “Large magnetoresistance and quantum oscillations in $\text{Sn}_{0.05}\text{Pb}_{0.95}\text{Te}$ ”. April 2021. Presented my research in front of other students and faculty at WTAMU.

Invited Lecture for Society of Physics Students, “Magnetoresistance studies of $\text{Sb}_2\text{Se}_2\text{Te}$ and $\text{Sb}_2\text{Te}_2\text{Se}$ ”. October 2021. Presented research to the Society of Physics Students University Organization.

Gulf Coast Undergraduate Research Symposium, Rice University, “Magnetoresistance Studies of $\text{Sb}_2\text{Se}_2\text{Te}$ and $\text{Sb}_2\text{Te}_2\text{Se}$ ”. October 16th, 2021. Presented research at the Applied Physics Section of the GCURS at Rice University.

Demonstration for WTAMU Family Weekend Event, “Magnetic Levitation using a YBCO superconductor”. November 2021. Demonstrated the interesting effects of

superconductivity to visiting families at WTAMU as well as the dean of the college and department head.

APS March Meeting 2022, “Doping dependence and Fermi surface studies of the topological crystalline insulators $\text{Sn}_x\text{Pb}_{1-x}\text{Te/Se}$ ”. March 2022. Accepted abstract to present at the APS March Meeting 2022 at Chicago.

PROFESSIONAL TRAINING

High Magnetic Field System Training

National High Magnetic Field Laboratory, Tallahassee, FL, November 8-12, 2021

Description: A brief introduction to large magnet systems at MagLab including sample loading into the cryostat, basic operation, and data collection.

Cryogenic Training, WTAMU, August 2020

Description: Training to handle Liquid Nitrogen and Liquid Helium

PROFESSIONAL SERVICE

APS March Meeting Session Chair

Chaired for a Friday session for the 2021 APS March Meeting.

COMMUNITY SERVICE

Society of Physics Students

President, WTAMU, 2019-2022

Atterbury Honors Program

WTAMU, 2018-2022

LANGUAGES

English: Native Language

Italian: Semi-Fluent, Intermediate Reader/ Writer

German: Certified novice speaker, novice reader/writer

COMPUTER SKILLS

Programming: Python, MatLab

Applications: Originlab, LaTeX