

MICHAEL DOBBS

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EDUCATION

Sonoma State University (SSU)

Graduated May 2017

Bachelor of Science, Applied Mathematics

Bachelor of Science, Physics

Minor, Chemistry

Mathematics GPA: 4.00; Physics GPA: 3.92; Overall GPA: 3.902

RESEARCH EXPERIENCE

b-Tagging Algorithm Characterization

June 2016 - August 2016

Particle Physics & Big Data Research; Advisor: Zihao Jiang

CERN, Geneva, Switzerland

- Awarded by the *NSF IRES Award* - \$10000
- Explained through physics the shapes of resulting statistical distributions
- Improve b-quark finding recurrent neural network algorithm by analyzing correlations of input variables
- Derived linear relation between two of the variables
- Accounted for relation by modifying algorithm

Calculation & Measurement of 1D Photonic Band Gap

August 2015 - December 2015

Materials Research; Advisor: Dr. Hongtao Shi

SSU, Rohnert Park, CA

- Fabrication of photonic crystal using lithographic techniques
- Numerically approximated disallowed frequency bands using the plane-wave expansion method
- Constructed optical system to measure transmitted bands

Analysis of Spattering Defects on Thin Films

August 2015 - December 2015

Materials Research; Advisor: Dr. Hongtao Shi

SSU, Rohnert Park, CA

- Studied defects on OptoSigma thin films, utilized Scanning Electron Microscope and Energy Dispersive X-Ray Spectroscopy
- Atomic Force Microscopy used to find depressions in film of 150nm - 900nm depth

Synthesization and Characterization of TMTSF Single Crystals

January 2015 - June 2015

Materials Research; Advisor: Dr. Jeremy Qualls

SSU, Rohnert Park, CA

- Awarded by the *Newkirk Student Assistantship Grant* - \$1250
- Voltaic H-Cell used to synthesize single crystals
- Superconducting low-temperature magnet to characterize magnetic/electrical properties
- Measurements of the Fermi Surface, De Haas-van Alphen Effect, and Shubnikov-de Haas Effect taken
- Troubleshooting electrical system, micro-manipulation to attach four-terminal sensing wires

Characterization of the Reactivity of Thiols and Persulfides

August 2013 - December 2013

Chemical Kinetics Research; Advisor: Dr. Jon Fukuto

SSU, Rohnert Park, CA

- Full reaction of an arbitrary persulfide and DTNB (used to quantify sulfur concentration) resolved
- Reaction orders for individual constituents found

WORK EXPERIENCE & VOLUNTEERING

High School Physics & Chemistry Instructor

Sonoma State University

January 2017 - Present

Rohnert Park, CA

- Position awarded through Saturday Academy Program at SSU
- Prepare and present lectures and labs for students
- Topics: computer applications, kinematics, low temperature physics, electronics

Voluntary Physics Lab Instructor

Sonoma State University

January 2016 - December 2016

Rohnert Park, CA

- Prepare and present lectures and labs for students
- Topics: computer applications and simulations, kinematics, electromagnetism, SEM, AFM

Voluntary Science Lab Instructor

La Tercera Elementary School

January 2015 - December 2015

Petaluma, CA

- Prepare and present lectures and labs for students
- Topics: astronomy, kinematics, basic chemistry, physical properties of solids, liquids, & gases

Mathematics, Physics, & Chemistry Supplemental Instructor

Sonoma State University

August 2014 - Present

Rohnert Park, CA

- Prepare and present lectures for students
- Aid students with questions on concepts and homework

Grader

Sonoma State University

August 2014 - Present

Rohnert Park, CA

- Calculus 1 & 2, Differential Equations, Multivariable Calculus
- General & Organic Chemistry

Tutor

Sonoma State University

January 2014 - Present

Rohnert Park, CA

- Calculus 1 & 2, Differential Equations, Multivariable Calculus, Combinatorics, Mathematical Modeling, Statistics, Probability Theory, Real Analysis
- Calculus & Trigonometry based Physics 1 & 2
- Electronics, Optics, Electricity & Magnetism, Analytical/Quantum Mechanics
- General, Organic, & Physical Chemistry

Bookkeeper & Customer Service Representative

Safeway

June 2012 - January 2014

Sonoma, CA

- Compose company branch's daily financial statement
- Log financial reports
- Reconcile accounts to ensure accuracy
- Troubleshoot computer problems occurring throughout the store
- Provide friendly and courteous customer service

AWARDS, MEMBERSHIPS, & PRESENTATIONS

Awards

- NSF IRES Award - \$10000
- Newkirk Student Assistantship Grant - \$1250
- Performance Scholarship (Merit-based) - \$2000
- Sonoma Valley Chapter of Realtors Scholarship -\$1000
- F. George Elliott funded Sonoma State University Scholarship - \$500
- Spanish-English Bilingual Award
- Dean's List - Sonoma State University (August 2012 - Present)
- TaeKwonDo Third Degree Black Belt Certificate

Memberships/Affiliations

- Society of Physics Students
(Elected Sonoma State SPS President for 2016 and won "Outstanding Chapter of the Year")
- American Mathematical Society
- Phi Beta Delta Honors Society for International Scholars (Inducted 2017)
- Math Club of Sonoma State
- American Association of Physicists in Medicine
- American Crystallographic Association
- American Physical Society

Presentations

- CERN Research; Physics Colloquium, Sonoma State University, September 2016,
URL: <https://www.youtube.com/watch?v=lv-_AILUrzk>
- CERN Research; Undergraduate Mathematics Conference, Sonoma State University, March 2017
- CERN Research; Mathematical Festival, Sonoma State University, April 2017
- CERN Research; Cal Poly San Luis Obispo Research Competition, April 2017
- CERN Research; Science Symposium, Sonoma State University, May 2017

SKILLS

Computer Languages

Proficient: ROOT, Wolfram, Python, L^AT_EX

Computer Programs

Intermediate: R, Octave, C++, Linux, Bash

Material Science

Excel, Labview, Microsoft Word & Powerpoint

Chemistry

Sputter Coating, Thermal Evaporation Coating, Chemical Vapor Deposition, SEM, EDX, AFM, XRD, Auger Spectroscopy, Vacuum Systems, Superconducting Magnets, Micro-Manipulation, Magnetometer, Four-Terminal Sensing, Glove Box, Photolithography

Electronics

UV Vis., Column Chromatography, Ordered Crystal Synthesization, NMR, Degasification, Ultrasonic Cleaner, Centrifuge, Distillation Board Design, Micro-Soldering, Chemical Etching, Oscilloscopes, Function Generators, Arduino, 3D Printer

Optics

Wave Front Sensing, Lenses, Deformable Mirrors, Polarizers, Lasers, Optical Fibers

REFERENCES

Dr. Hongtao Shi
Physics Department
Sonoma State University
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Rohnert Park, CA, 94927
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Terri Nichelini
Bookkeeping Department
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477 West Napa Street
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UNIVERSITY CLASSES & SCORES

Mathematics:

Differential & Integral Calculus I & II - A
Introduction to Higher Math - A
Differential Equations - A
Multivariable Calculus - A
Numerical Analysis - A
Graph Theory - A
Combinatorics - A
Real Analysis I, II - A, A
Probability Theory - A
Mathematical & Statistical Modeling - A
Linear Algebra - A
Mathematical Stats & Operations Research - A

Other Science/Tech.:

Quantitative General Chemistry - A
Organic Chemistry I, II, & Lab - B, A, A
Physical Chemistry - A

Physics:

Introduction to Physics I, II, & III - A, A, A
Introduction to Physics I, II Lab - A-, A-
Mathematical Physics - A
Intermediate Experimental Physics - A-
Advanced Experimental Physics - A
Computer Applications for Physicists - A-
Statistical Physics - A
Electronics & Lab - A
Analytical Mechanics - A-
Light & Optics - A
Photonics - A
Electricity & Magnetism - A
Quantum Physics - A
Physics of Semiconductors - A