

Alberto Acevedo
3425 East 2nd st, Tucson, AZ 85716
Phone: 909-763-1876
e-mail: albertoacevedo@math.arizona.edu

Status

I am currently a third year PhD student at the University of Arizona's department of mathematics. My research interest are Quantum Open Systems, Quantum Information/Computation, and Quantum Decoherence. I work on my secondary languages and prepare for distance runs in my spare time.

Education:

University of Arizona, Tucson, AZ PhD, Applied Mathematics (Expecting to graduate spring 2021)	August 2017- Present
California State University (CSUSB), San Bernardino, CA Bachelors of Science, Mathematics	June 2015
California State University, San Bernardino, CA Bachelors of Science, Physics	June 2015

Research Experience:

REU research intern	California State University of San Bernardino San Bernardino, CA.	Summer 2012 Duration: 6 weeks
----------------------------	------------------------------------------------------------------------------	------------------------------------------

Mentor and Coordinator: Dr. Min-Lin Lo

I was part of a group of undergraduate students; we worked in a environment that emphasized team work. We were each expected to conduct complex calculations and investigations which were heavily related to the mathematical field of Graph Theory. We learned the fundamentals of the Theory of Graphs; we were previously unacquainted with this theory, but within a couple of weeks we ultimately produced some original results. The results were later presented at JMM 2013, a prestigious mathematics convention.

REU research intern	Brigham Young University Provo, UT	Summer 2013 Duration:10 weeks
----------------------------	-----------------------------------------------	------------------------------------------

Mentor and coordinator: Dr. Jean-Francois VanHuele(Associate Professor at BYU)

As an intern, I worked under the guidance of a mentor, where my primary role was to aid and assist my mentor in his immediate research, at the corresponding time, which focused on Theoretical Quantum Dynamics. My duties were: Learning and applying abstract mathematics; learning and applying physical concepts; learning and incorporating Mathematica, a programming language, into my research; learning and incorporating Latex, a typesetting language, weekly progress reports, end of internship formal presentation, delivery of a power point presentation at Four Corners APS 2013, a prestigious physics convention.

REU research intern

**California State University of San Bernardino
San Bernardino, CA.**

**Summer 2014
Duration: 8 weeks**

Mentor and coordinator: Dr. Corey Dunn (Associate Professor at CSUSB)

As an intern, I worked under the guidance of a mentor, where my primary role was to aid and assist my mentor in his immediate research, at the corresponding time, which focused on Differential Geometry Theory. My duties were: Learning and applying abstract mathematics with a strong focus on differential geometry, weekly daily presentations and collaborations with mentor, produce original results, compose a final report including all of the results I attained, and deliver a formal synopsis of all of my work over the eight week period on the final day of the program.

Research Aide

Argonne National Laboratory

May 2019- August 2019

Duration: 13 weeks

Mentor and coordinator: Dr. Yuri Alexeev (senior scientist at Argonne national lab's Department of computational science).

Developed software for the quantum computing framework Qiskit for the treatment of molecular dynamical problems. The software used a quantum mechanical approach to molecular dynamics rather than a classical one which most computational software exploits. This software was used on IBM simulators and quantum computers in order to compare with existing classical methods.

PhD Research

The University of Arizona

August 2017-Present

Mentor: Jan Wehr (Professor at The University of Arizona)

My topic of interest is Quantum Open systems, general decoherence theory, Quantum to Classical transitions and software development for quantum machines with Qiskit(Quantum information systems kit by IBM). As PhD students the University of Arizona expects us to continuously perform research year-round. We are expected to present our research and write a report each semester.

Work Experience:

Mathematics Tutor

CSUSB Math Department

Winter 2012-Winter 2016

Supervisor: Dr. Min-Lin Lo(Associate Professor at CSUSB)

Topics tutored: Single and Multivariable Calculus, Combinatory, Probability theory, Partial and Ordinary Differential Equations, Analysis, Number Theory, Group theory, Ring theory, linear algebra, Transformation Geometry, Fourier analysis.

As a mathematics tutor at the mathematics department of CSUSB I handled walk in tutoring sessions throughout all of my working hours. The environment was very fast pace on most days and specially hectic on the days approximating midterms. In order to handle the constant heavy influx of students I worked closely with my tutoring partners and managed the immediate students in effective ways that made it possible for us, the tutors, to answer everyone's questions.

Mathematics Tutor

LSAMP CSUSB branch

Winter 2012-Winter 2015

Supervisor and LSAMP coordinator: Dr. Belisario Ventura (Associate professor at CSUSB)

Topics tutored: Single variable calculus.

LSAMP is a program specially tailored for underrepresented students, such as first generation college students, minorities, and low income students. I was hired in order to provide special tutoring sessions for the LSAMP students at CSUSB that were taking single variable calculus. My tasks were workshop preparation and dissemination, and scheduling optimization. Aside from the material in my workshop I would typically address common homework questions at the end of my sessions.

Physics Tutor

CSUSB Physics Department

Fall 2014-Winter 2015

Supervisor: Maureen Murphy (CSUSB's physics's department's secretary)

Topics tutored: Mathematical methods in physics, classical mechanics, quantum mechanics, statistical thermal physics, optics, electrodynamics, special relativity.

As a physics tutor at the physics department of CSUSB I handled walk in tutoring sessions throughout all of my working hours. The environment was very fast pace on most days and specially hectic on the days approximating midterms. In order to handle the constant heavy influx of students I had to manage the immediate students in effective ways that made it possible for me - I was the only physics tutor at CSUSB during the responding period - to answer everyone's questions.

Supplementary Instructor

CSUSB Graduate studies

Winter and Spring of 2016

Supervisor and Boss: Francisca Beer (Dean of The Office of Graduate Studies at CSUSB)

Topics instructed: Junior level classical mechanics, Senior level optics, and senior year quantum mechanics.

As a supplemental instructor for the office of graduate studies at CSUSB I worked closely with the students and professors of the courses I was supplementing. I was required to attend the course I supplemented in order to reinforce my already existing knowledge of the material and to build a mentorship type of relationship with the students of the course. Each week I was required to create two one hour long supplementary courses specifically developed to help students comprehend the material being covered, the means by which I accomplished that depended on the students reactions to the immediate material but in general I spent a lot of time developing problem solving workshops for the students.

Supplementary Instructor

CSUSB Undergraduate Studies

Spring 2016

Supervisor and Boss: James Graham (Coordinator of Supplemental Instruction)

Topics instructed: College algebra.

As an SI I created weekly supplementary lessons that focused on problem solving and general student development for two college algebra sections. The majority of the time of my sessions was dedicated to topics the professor of the course, whom I worked with closely, noticed the students were struggling with. Substantial time was also dedicated to general study habit development, mental health, coping with examination anxiety techniques, and general college life and advice oriented lectures. The idea was simple, if we could teach the students how to be effective in college then they would be able to succeed in all other courses as well and not just math. In order to develop general student development seminars I

had to work closely with my supervisor who was a lot more knowledgeable in these matters than I was at the time.

Supplementary Instructor Mentor **CSUSB Undergraduate Studies** **Spring 2016**

Supervisor and Boss: James Graham (Coordinator of Supplemental Instruction)

As an SI mentor for supplemental instruction at CSUSB I was in charge of overseeing four supplemental instructors throughout the spring quarter of 2016. I served as a mentor to each of the four supplemental instructors, managed one on one meetings with my supplemental instructors, conducted session evaluations for each one of my supplemental instructors, and ultimately reported progress, concerns, and/or any relevant issues regarding my supplemental instructors to my boss James Graham. In short, I functioned as an intermediate between the supplemental instructors I was in charge of and the supplemental instruction coordinator James Graham.

Online English/Spanish Teacher **Italki.com** **July 2016- August 2017**

Self employed.

As an online Spanish and English teacher, I have the great pleasure of meeting with a diverse set of people over the Internet. I prepare content specifically suited for each student's learning needs and desires. I have worked with about 25 students so far and have provided about 100 lessons with an average duration of one hour per session.

Warehouse Package Handler **Amazon** **March 2017-July 2017**

Managed the outflow of item orders. 10 hour long shifts of continuous marching through the warehouse searching and picking item orders.

College Algebra Course Instructor **University of Arizona** **August 2017- December 2018**

I taught my own college algebra section at the University of Arizona. My duties are lesson planning, creating homework assignments, grading, and course webpage management and hosting office hours for my students.

Business Calculus Course Instructor **University of Arizona** **January 2019-May 2019**

I taught my own business calculus section at the University of Arizona. My duties are lesson planning, creating homework assignments, grading, and course webpage management and hosting office hours for my students.

Presentations

-“Radio labeling of fifth power graphs” was presented at: SCCUR 2012 (presentation format), JMM 2013 (poster), other MAA meetings at CSU Long Beach and University of San Diego during 2012 and 2013 (presentation format), Meeting of the minds at CSU San Bernardino 2014 (presentation format), Independent Study Presentation at CSU San Bernardino 2013 (presentation format).

-“Quantum Dynamics and Lie Algebras” was presented in presentation format at: APS four corners meeting 2013 and 2014, ERN meeting in Washington D.C. 2014

-“Distance sets and coloring parameters” was presented in presentation format at the west coast joint MAA meeting 2015.

-“On spontaneous emission and the Lindblad Master equation” was presented in presentation format as part of a domestic mini conference at the University of Arizona on December 8th 2017.

-“Spontaneous emission and the Langevin formulation of quantum open systems” was presented in presentation format as part of a mini domestic conference at the University of Arizona on May 1st 2018.

-“On spontaneous emission and quantum coherence” was presented in presentation format as part of an isolated applied mathematics seminar at the University of Arizona on October 26th 2018.

-“SBS structures in scattering induced decoherence” was presented in presentation format as part of an isolated applied mathematics seminar at the University of Arizona on May 2019.

-“Implementing Hellmann-Feynman theorem and VQE within Qiskit framework in order to generate molecular dynamics of diatomic systems” was presented in presentation format as part of an isolated applied mathematics seminar at the University of Arizona on October 26th 2019.

Grants and Fellowships:

-The \$1000 merit award for transfer students from LSAMP 2011.

-LSAMP Alliance Fellowship 2012.

-NREU Radio Labeling Fellowship 2012.

-ASI Scholarship CSU San Bernardino 2012.

-REU BYU physics fellowship 2013.

-REU CSUSB differential geometry fellowship 2014.

-PUMP URG 2015.

-Graduate Access Fellowship 2017-2018 (University of Arizona domestic fellowship).

-Graduate College Fellowship 2017-2018 (University of Arizona domestic fellowship).

- The University of Arizona’s GPSC Travel grant for Spring 2019.

- Graduate Assistantship for the academic year 2019-2020 at the University of Arizona under Dr. Jan Wehr from the Mathematics department at the University of Arizona. .

Awards and Honors:

-Graduated with Honors in Mathematics due to completion of independent study in mathematics, a presentation on the topic (which was a continuation of the research I began in the summer of 2012 on graph theory), and an overall GPA above 3.5 in my mathematics courses.

- Graduated with Honors from the Physics department at CSUSB after attaining a cumulative GPA greater than 3.5 in my physics course work.

Other Skills:

- Native Spanish speaker.
- Fluent French speaker.
- MATLAB.
- Python.
- C++.
- Qiskit.