Magdalena I. Sammut

msammut@arizona.edu | LinkedIn Magdalena Sammut

Education

Aug 2023 - present **University of Arizona** GPA: 3.78/4.00

Bachelor of Science in Astronomy with a minor in physics

- Relevant Coursework: Astronomy I, Mechanics, Optics and Thermodynamics, Electricity and Magnetism, Quantum Mechanics I, Theoretical Mechanics, Math Techniques in Physics, Vector and Multivariable Calculus, Differential Equations, Computer Programming I

Bachelor of Arts in Arabic

- Member of the Arabic Language Flagship Program

Research Experience

Aug 2024 - present **Undergraduate Research Assistant** University of Arizona
Mentor: Dr. Tim Eifler Tucson, AZ

- Forecasting the science of performance of the Roman Space Telescope (launch 2026) to optimize cosmological analysis, and constraints on dark energy
- Using the CoCoA (Cobaya CosmoLike Architecture) software framework to run simulated MCMC analyses on UA High Performance Computers
  - CoCoA is a combined C and Python software framework that models cosmological observables and uses Bayesian Inference to calculate constraints on cosmological parameters
- Training a neural network (PyTorch) to speed up the calculation of cosmological model
- Scheduled to present my research to astronomers, faculty, and colleagues on April 24, 2025

Oct 2024 - present **Independent Research** University of Arizona
Supervised by Dr. Fulvio Melia Tucson, AZ

- Designed a research project to measure the magnetic field at Hoover Dam in collaboration with a peer
- Calculated the projected magnetic field at the dam at different temperatures to determine if there is a significant dependence on magnetic field
- Wrote and presented a research proposal to the department head and a faculty member
- Approved to spend $100 in instrumentation to first conduct a small scale experiment in Tucson

Jul 2022 - Aug 2022 **National Synchrotron Light Source - II Intern** Brookhaven National Laboratory
Mentor: Dr. Dean Hidas Upton, NY

- Used Python in Jupyter Notebooks to fit linear, exponential, and power law curves to synchrotron data with Matplotlib, reducing pre-experimentation calculation time.
- Utilized a chi square calculation to verify fit quality
- Determined the maximum brightness that can be produced for given synchrotron parameters
- Presented the results of this research to researchers and general public
- Wrote a paper on the results, and was selected as a semifinalist to present to the Junior Humanities and Science Symposium at CUNY York College (January 2023)

Skills

Aug 2024 - present **TIMESTEP Research Apprenticeship Program** University of Arizona
Tucson, AZ

- Selected as one of fourteen students for a paid research position during the 2024-2025 academic year (see above: *Undergraduate Research Assistant*)
- Participated in extensive hand-on workshops encompassing scientific paper review, keeping research notes, Linux, GitHub, high-performance computing, Astropy, NumPy, secure shell (ssh), Raspberry pi, and curve fitting astronomical data

Teaching Experience

Oct 2024 - present **Math Tutor** Islamic Center of Tucson
Islamic Center of Tucson Tutoring Program Tucson, AZ

- Mentor one to two students between kindergarten and twelfth grade in mathematics for one hour every Sunday

Aug 2024 - present **Teacher's Assistant** Islamic Center of Tucson
Islamic Center of Tucson Tucson, AZ

- Teaching religious lessons and Arabic to approximately 25 children aged between nine and ten for four hours every Sunday
- Prepare lesson plans and cultivate an engaging environment of mutual respect

Projects

Nov 2024 **The Shared Evolutionary History of Uranus and Neptune** Grade: 100%

- Wrote a research paper arguing Uranus and Neptune share a similar evolutionary history, following a Nice model in which Uranus formed exterior to Neptune
- Reviewed more than a dozen academic papers to support my argument

May 2024 **The Language Attitudes of a Saudi Arabian Woman towards Standard and Regional Arabic** Grade: 100%

- Interviewed a woman from Saudi Arabia to research how she feels about her regional dialect of Arabic versus standardized Arabic
- Compared her answers to past linguistic research to examine correlations and differences in language attitudes from different time periods and regions.
- Studied previous literature to determine trends in language attitudes

Awards and Scholarships

Aug 2023 - present **Arabic Language Flagship** University of Arizona
$11,000 to study abroad

- Awarded government funding to develop my Arabic proficiency and further my Arabic degree in Morocco

Apr 2023 - present **Arizona Excellence Tuition Scholarship**
$20,000 per year, 4 years

- Awarded to incoming freshmen who completed high school with a GPA of 3.75-3.89 and maintain a GPA of at least 3.0

May 2024 - present **Dean's List** University of Arizona

- Awarded to students with a GPA of 3.50-3.99 at the end of the semester

May 2024 - present **Academic Distinction: 2023 - 2024** University of Arizona

- Awarded to students with a GPA of 3.500 - 3.999 at the close of the academic year

Dec 2023 - May 2024 **Dean's List with Distinction** University of Arizona

- Awarded to students with a 4.0 GPA at the end of the semester