Grace Krahm

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EDUCATION

Agnes Scott College **Decatur, GA**
Bachelor of Science in Astrophysics Expected May 2024
GPA: 3.982

- Honors: Elizabeth Kiss Trailblazer Scholarship 2020-Present, Dean's list 2021 and 2022, William A. Calder award in Physics and Astronomy 2023
- Relevant Coursework: Classical Mechanics, Quantum Physics, Astrophysics: Radiation, Astrophysics: Dynamics, Intermediate Observation Techniques, Thermal Physics, Nonlinear Dynamics, General Relativity

EXPERIENCE

Undergraduate Research Assistant, University of Florida **Charlottesville, VA**
Research Experiences for Undergraduates (REU) May 2023-Present

- Advisor: Prof. Desika Narayanan
- Quantified the contribution of nebular line emission in SED-derive galaxy masses for high-redshift galaxies
- Created a pipeline from simulated galaxy to SED-derived galaxy mass using Simba hydrodynamical galaxy simulations, Powderday radiative transfer code, and Prospector SED fitting tools

Undergraduate Research Assistant, National Radio Astronomy Observatory (NRAO) **Charlottesville, VA**
Research Experiences for Undergraduates (REU) May 2022-Present

- Advisors: Dr. Molly Finn and Prof. Remy Indebetouw
- Identified and calculated physical properties of individual molecular clouds in the super star cluster (SSC) forming Antennae galaxies using CO, HCO+, and HCN emission data from the Atacama Large Millimeter/submillimeter Array.
- Compared properties of molecular clouds in the Antennae galaxies to both SSC-forming and non-SSC-forming galaxies to characterize the relationship between massive star formation and the properties of the molecular clouds they form in.
- This research experience was supported through the summer by the NRAO REU program and then continued on into the school year as a research credit for my major.

Learning Assistant, Agnes Scott College Resource Center for Math and Science (RCMS) **Decatur, GA**
August 2021-Present

- Staff the Resource Center for Math and Science tutoring 100-200 level math, physics, and astronomy courses.
- Communicating with students, encouraging them to be active in their learning, and finding what methods help them to learn.
- Communicating the students' needs and what teaching methods work best for them to the professors.
- Teaching students problem-solving methods they can apply to different situations.

Radial Velocity of Star Clusters, Agnes Scott College **Decatur, GA**
Astrophysics I: Radiation Research Project January-May 2022

- Advisor: Dr. Alexandra Yep
- Observed spectra of the open cluster NGC 2244 using the 0.9 m SARA (Southeastern Association for Research in Astronomy) telescope at Kitt Peak (SARA-KP) and its fiber-fed echelle spectrograph.
- Calibrated the wavelengths of the spectral lines using spectra of a thorium-argon lamp and determined the redshift of individual stars in the cluster by comparing their lines to the reference spectra of Alpha

CMi.

- Calculated the radial velocities of the selected stars using the observed redshift and the Doppler effect which averaged together to give a radial velocity estimate of the cluster of 37.2 km s^{-1} which is 11% higher than the radial velocity recorded in the Simbad astronomical database.

Undergraduate Research Assistant, Agnes Scott College **Decatur, GA**
STEM Scholars Program June 1-July 31 2021

- Advisor: Prof. Alan Koch
- Aided in the effort to determine whether or not a perfect cuboid with integer dimensions exists.
- Searched for solutions of a perfect cuboid both analytically and numerically using modular arithmetic and python programming respectively.
- Placed additional limitations on the side lengths and diagonals that a theoretical perfect cuboid must have.

HR Diagram Construction of Globular Clusters, Agnes Scott College **Decatur, GA**
Intermediate Observation Techniques Research Project January-May 2021

- Advisor: Prof. Amy Lovell
- Observed the globular clusters M53 and M79 in the filters Cousins R, Johnson V, and Johnson B using the 1m Jacobus Kapteyn SARA Telescope
- Calibrated the images and recorded the flux values in the B and V filters for 100 stars in each cluster using MaxIm DL.
- Constructed Hertzsprung-Russell (HR) diagrams of the clusters by plotting the stars' B-V color index against their flux values in the V filter. These HR diagrams where then used to estimate the ages of M53 and M79 using isochrones.

PRESENTATIONS

Conference for Undergraduate Women in Physics (CuWip) at Auburn **Auburn, AL**
Super Star Cluster Formation in the Antennae Overlap January 21st, 2023

American Astronomical Society 241st Meeting **Seattle, WA**
Super Star Cluster Formation in the Antennae Overlap January 10th, 2023

NRAO Summer Student Research Symposium **Charlottesville, VA**
Physical Conditions of Molecular Clouds in the Merging Antennae Galaxies July 28th, 2022

Spring Annual Research Conference (SpARC), Agnes Scott College **Decatur, GA**
The Search for a Cuboid April 20th, 2022

STEM Scholars Symposium, Agnes Scott College **Decatur, GA**
The Search for a Cuboid July 28th, 2021

SKILLS

- Data processing, image calibration, and statistical analysis
- Taking photometric and spectrographic images of stars and galaxies using the Southeastern Association for Research in Astronomy (SARA) telescopes.
- Planetarium operations
- Software: Python, CASA, LaTeX, MaxIm DL, Microsoft/Office Suite, and Maple
- Languages: English (native language), French (B1 on the European Framework for Language)
- Certified by the Dance Notation Bureau in beginner labanotation