

# Grace Krahm

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## EDUCATION

### **Agnes Scott College**

*Bachelor of Science in Astrophysics*

GPA: 3.982

**Decatur, GA**

Expected May 2024

- Honors: Elizabeth Kiss Trailblazer Scholarship received upon admission of \$27,000 yearly renewable for up to four years, Dean's list 2021 and 2022
- Relevant Coursework: Classical Mechanics, Quantum Physics, Astrophysics: Radiation, Astrophysics: Dynamics, Intermediate Observation Techniques, Thermal Physics, Nonlinear Dynamics

## EXPERIENCE

### **Undergraduate Research Assistant, National Radio Astronomy Observatory (NRAO) Charlottesville, VA**

*Research Experiences for Undergraduates (REU)*

May 2022-Present

- Advisors: Molly Finn and Remy Indebetouw, PhD
- Identified and calculated physical properties of individual molecular clouds in the super star cluster (SSC) forming Antennae galaxies using CO 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.
- Attended weekly meetings with the seven-person Interstellar Medium/Star Formation research group.
- 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

- 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  $37.2 \text{ km s}^{-1}$  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: Alan Koch Ph.D.
- 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**

*Intermediate Observation Techniques Research Project*

**Decatur, GA**

January-May 2021

- Advisor: Amy Lovell Ph.D.
- 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 were then used to estimate the ages of M53 and M79 using isochrones.

## **PRESENTATIONS**

### **Conference for Undergraduate Women in Physics (CuWip) at Auburn**

*Super Star Cluster Formation in the Antennae Overlap*

**Auburn, AL**

January 21st, 2023

### **American Astronomical Society 241st Meeting**

*Super Star Cluster Formation in the Antennae Overlap*

**Seattle, WA**

January 10th, 2023

[iPoster Link](#)

### **NRAO Summer Student Research Symposium**

*Physical Conditions of Molecular Clouds in the Merging Antennae Galaxies*

**Charlottesville, VA**

July 28th, 2022

### **Spring Annual Research Conference (SpARC), Agnes Scott College**

*The Search for a Cuboid*

**Decatur, GA**

April 20th, 2022

### **STEM Scholars Symposium, Agnes Scott College**

*The Search for a Cuboid*

**Decatur, GA**

July 28th, 2021

## **SKILLS**

- Data processing, image calibration, and statistical analysis
- Communicating findings in both written and oral form
- 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

## **PROFESSIONAL AFFILIATIONS**

- Society of Physics Students (SPS)
- American Astronomical Society (AAS)